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(12) **United States Patent**  
**Liu**

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(54) **FOLDABLE WALKER APPARATUS**

(56) **References Cited**

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U.S. PATENT DOCUMENTS

(72) Inventor: **Julian Liu**, Port Moody (CA)

522,117 A	6/1894	Humphrey
534,443 A	2/1895	Manguine
879,803 A	2/1908	Vlasak
1,767,925 A	6/1930	Hargreaves

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(Continued)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 16 days.

FOREIGN PATENT DOCUMENTS

AT	214095	3/1961
AT	242315	9/1965

(Continued)

This patent is subject to a terminal disclaimer.

OTHER PUBLICATIONS

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(51) **Int. Cl.**

**F16D 65/14** (2006.01)

**A61H 3/04** (2006.01)

**G05G 1/04** (2006.01)

(52) **U.S. Cl.**

CPC .. **A61H 3/04** (2013.01); **G05G 1/04** (2013.01);  
**A61H 2003/046** (2013.01); **A61H 2201/0161**  
(2013.01); **A61H 2201/1633** (2013.01); **Y10T**  
**74/20396** (2015.01)

(58) **Field of Classification Search**

CPC .. A61H 2003/046; B62B 5/04; B62B 5/0438;  
B62B 5/0447; B62B 9/08; B62B 9/085;  
F16D 2125/70; Y10T 74/20396; Y10T  
**74/20468**

USPC ..... 188/2 A, 2 D, 2 E, 19, 20, 29, 2 F  
See application file for complete search history.

A web screen shot printout from doclibrary.invacare.fr . . . (?) dated Aug. 6, 2013, in which adjacent to the heading "Dolomite Jazz", a "Jazz Sales Brochure" is listed as . . . having a "start date of validity" of May 1, 2008, and in which a "Jazz spare parts list" is listed as having a "start date of validity" of May 1, 2008.

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*Primary Examiner* — Thomas J Williams

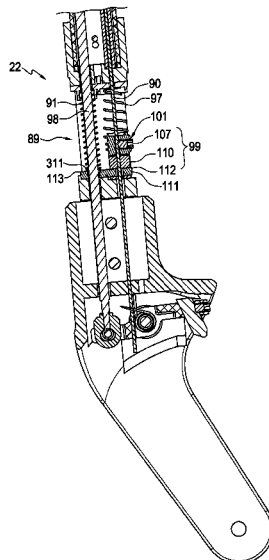
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(57)

**ABSTRACT**

There is provided a brake rod assembly for a walker apparatus. The assembly includes a brake rod operatively connected to a brake for braking the walker apparatus. The assembly includes a connection member operatively connected to a brake handle. The assembly includes a gripping member that is spring-biased to slidably receive the brake rod. The gripping member has an adjustment mechanism rigidly connected thereto that adjustably engages a connection member. Actuation of the connection member tilts the gripping member upwards and engages the brake rod for braking the walker apparatus.

**10 Claims, 24 Drawing Sheets**



(56)

## References Cited

## U.S. PATENT DOCUMENTS

2,356,793 A 8/1944 O'Connor et al.  
 2,483,307 A 9/1949 Wheary, Jr.  
 2,681,809 A 6/1954 Hamill  
 2,710,084 A 6/1955 Braverman  
 2,732,047 A 1/1956 Finkelstein  
 2,987,149 A 6/1961 Finkelstein  
 3,194,577 A 7/1965 Berlin  
 3,409,105 A \* 11/1968 Clinton ..... 188/29  
 3,692,155 A 9/1972 Laurita  
 3,890,668 A 6/1975 Stosberg et al.  
 3,927,727 A 12/1975 Hanagan  
 4,087,141 A 5/1978 Roberts  
 4,149,721 A 4/1979 Strickland  
 4,286,401 A 9/1981 Pachmayr et al.  
 4,371,183 A 2/1983 Dion  
 4,415,198 A 11/1983 Brearley  
 4,460,188 A 7/1984 Maloof  
 4,477,098 A 10/1984 Minnebraker  
 4,570,370 A 2/1986 Smith et al.  
 4,722,114 A 2/1988 Neumann  
 4,800,911 A 1/1989 Endres et al.  
 4,856,123 A 8/1989 Henderson et al.  
 4,883,317 A 11/1989 Davenport  
 4,890,355 A 1/1990 Schulten  
 4,907,839 A 3/1990 Rose et al.  
 4,930,697 A 6/1990 Takahashi et al.  
 5,158,313 A 10/1992 Becker  
 5,167,048 A 12/1992 Geiger et al.  
 5,269,157 A 12/1993 Ciminelli et al.  
 5,353,824 A 10/1994 Woods et al.  
 5,380,034 A 1/1995 Wilson  
 5,429,377 A 7/1995 Duer  
 5,465,745 A 11/1995 Davis  
 5,475,896 A 12/1995 Wang  
 5,499,697 A \* 3/1996 Trimble et al. .... 188/19  
 5,551,413 A 9/1996 Walk  
 5,605,345 A 2/1997 Erfurth et al.  
 5,621,997 A 4/1997 Pearce  
 5,622,404 A 4/1997 Menne  
 5,632,362 A \* 5/1997 Leitner ..... 188/2 D  
 5,640,741 A 6/1997 Yano  
 5,722,717 A 3/1998 Rettenberger  
 5,772,234 A 6/1998 Luo  
 5,774,936 A 7/1998 Vetter  
 5,816,650 A 10/1998 Lucas, Jr.  
 5,915,712 A 6/1999 Stephenson et al.  
 5,954,161 A 9/1999 Lee  
 6,082,468 A 7/2000 Pusateri et al.  
 6,112,446 A 9/2000 Förster et al.  
 6,161,896 A 12/2000 Johnson et al.  
 6,189,914 B1 2/2001 Worth et al.  
 6,196,562 B1 3/2001 Zhuang  
 6,283,484 B1 9/2001 Malmstrom  
 6,311,708 B1 11/2001 Howle  
 6,338,493 B1 1/2002 Wohlgemuth et al.  
 6,340,168 B1 1/2002 Woleen  
 6,378,883 B1 4/2002 Epstein  
 6,401,321 B2 6/2002 Carey et al.  
 6,467,785 B2 10/2002 Toppses  
 6,527,136 B1 3/2003 Sabounjian  
 6,584,641 B1 7/2003 Milbredt  
 6,604,789 B1 8/2003 Downing  
 6,651,994 B2 11/2003 Hallgrímsson et al.  
 6,655,702 B2 12/2003 Senger  
 6,688,633 B2 2/2004 van't Schip  
 6,754,936 B2 6/2004 Ereñaga

6,817,066 B1 11/2004 Williams et al.  
 6,837,503 B2 1/2005 Chen et al.  
 6,889,998 B2 5/2005 Sterns et al.  
 7,052,030 B2 5/2006 Serhan  
 7,384,058 B2 6/2008 Munsey et al.  
 7,445,216 B1 11/2008 Chou  
 7,500,689 B2 3/2009 Pasternak et al.  
 7,559,560 B2 7/2009 Li et al.  
 7,587,852 B1 9/2009 Harms  
 7,775,547 B2 8/2010 Dotsey et al.  
 7,837,205 B2 11/2010 Simard  
 7,926,834 B2 4/2011 Willis  
 7,980,415 B2 7/2011 Crawley  
 8,020,679 B2 9/2011 Wu  
 8,157,273 B2 4/2012 Bar-Lev  
 8,167,351 B2 5/2012 Plowman  
 8,251,380 B2 \* 8/2012 Liu ..... 188/2 D  
 8,424,215 B2 4/2013 Quintiliani et al.  
 8,448,960 B2 \* 5/2013 Liu ..... 188/2 D  
 8,505,936 B2 8/2013 Liu  
 8,511,694 B2 8/2013 Bradshaw et al.  
 8,517,399 B2 8/2013 Liu  
 8,573,613 B2 11/2013 Liu  
 8,602,424 B2 12/2013 Liu  
 D697,163 S 1/2014 Bietsch  
 8,801,073 B1 8/2014 Gray, Jr. et al.  
 8,857,093 B2 10/2014 Hogue  
 2002/0093178 A1 7/2002 Turner et al.  
 2003/0226584 A1 12/2003 Serhan  
 2004/0094999 A1 5/2004 Volotsenko  
 2005/0057021 A1 3/2005 Miyoshi  
 2005/0121481 A1 6/2005 Chiu  
 2005/0156404 A1 7/2005 Lauren et al.  
 2005/0250605 A1 11/2005 Moore et al.  
 2006/0156511 A1 7/2006 Li  
 2007/0199586 A1 8/2007 Cheng  
 2008/0042476 A1 2/2008 Hei et al.  
 2008/0121258 A1 5/2008 Lin  
 2009/0033052 A1 2/2009 Bradshaw et al.  
 2009/0206578 A1 8/2009 Pizmony et al.  
 2011/0173861 A1 7/2011 Roth  
 2011/0241303 A1 10/2011 Campbell  
 2013/0168947 A1 7/2013 Offord  
 2013/0264787 A1 10/2013 Cheng et al.  
 2014/0125037 A1 5/2014 Andersen  
 2014/0312586 A1 10/2014 Cheng et al.

## FOREIGN PATENT DOCUMENTS

EP 1092411 4/2001  
 EP 2090276 8/2009  
 EP 2522404 11/2012  
 WO WO 2004073578 A1 \* 9/2004  
 WO 2008019454 2/2008

## OTHER PUBLICATIONS

Two web screen shot printouts from [doclibrary.invacare.fr](http://doclibrary.invacare.fr) . . . (?) dated Aug. 6, 2013, in which adjacent to a “Dolomite Jazz” heading, “2007” is set out by a “TUV certificate”.

Two web screen shot printouts from [handicat.com/classif4-num-03-09-06.html](http://handicat.com/classif4-num-03-09-06.html), dated Aug. 6, 2013, in which adjacent to a “Dolomite Jazz” heading, the words “Crée le . . . May 7, 2008—Modifiée: Jul. 24, 2013”, which may mean “Created on May 7, 2008—Modified Jul. 27, 2013”.

A web screen shot printout of [web.archive.org/web/20080508194602/http://www.dolomite.biz/](http://web.archive.org/web/20080508194602/http://www.dolomite.biz/), dated May 8, 2008.

\* cited by examiner

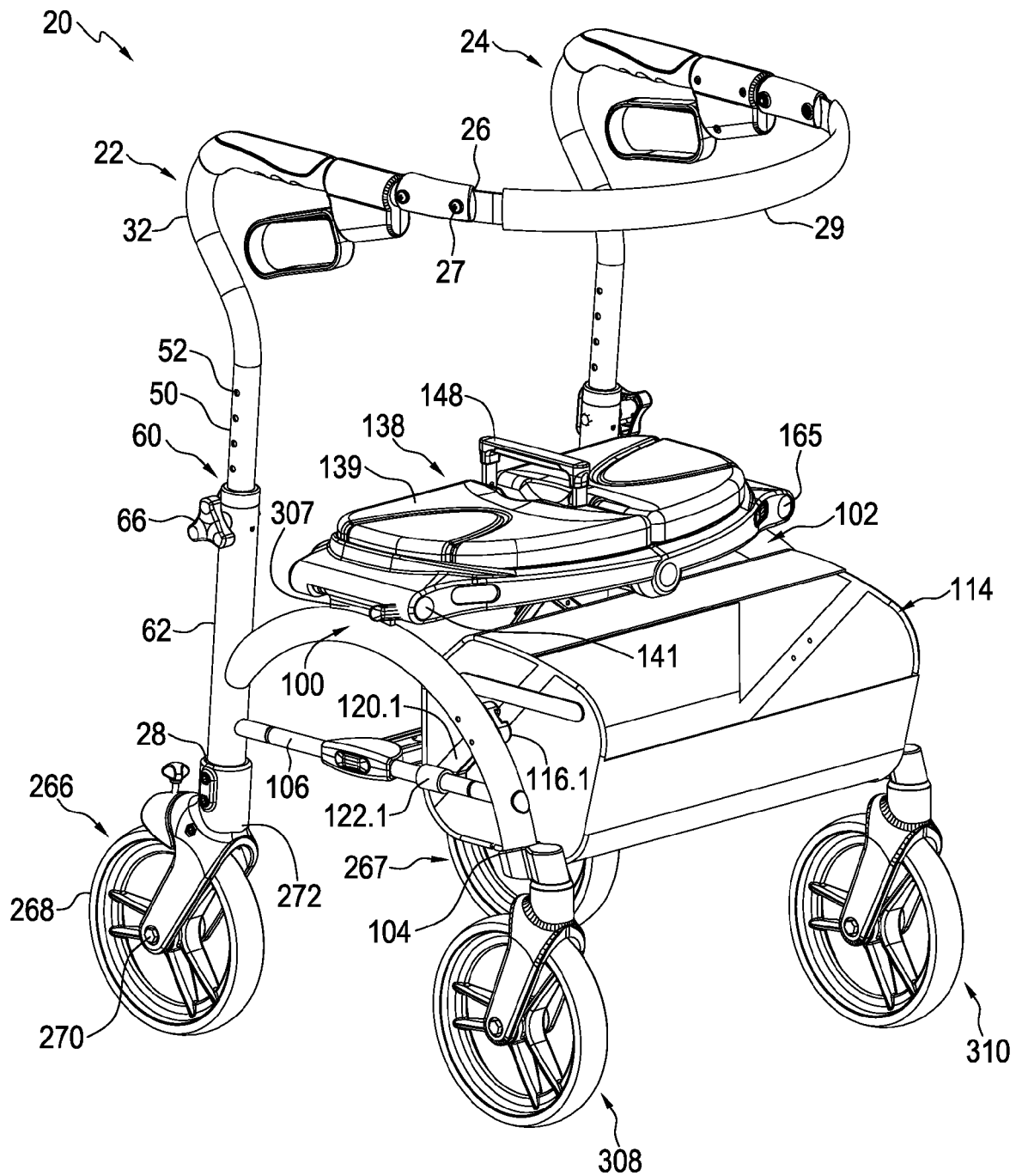


FIG. 1

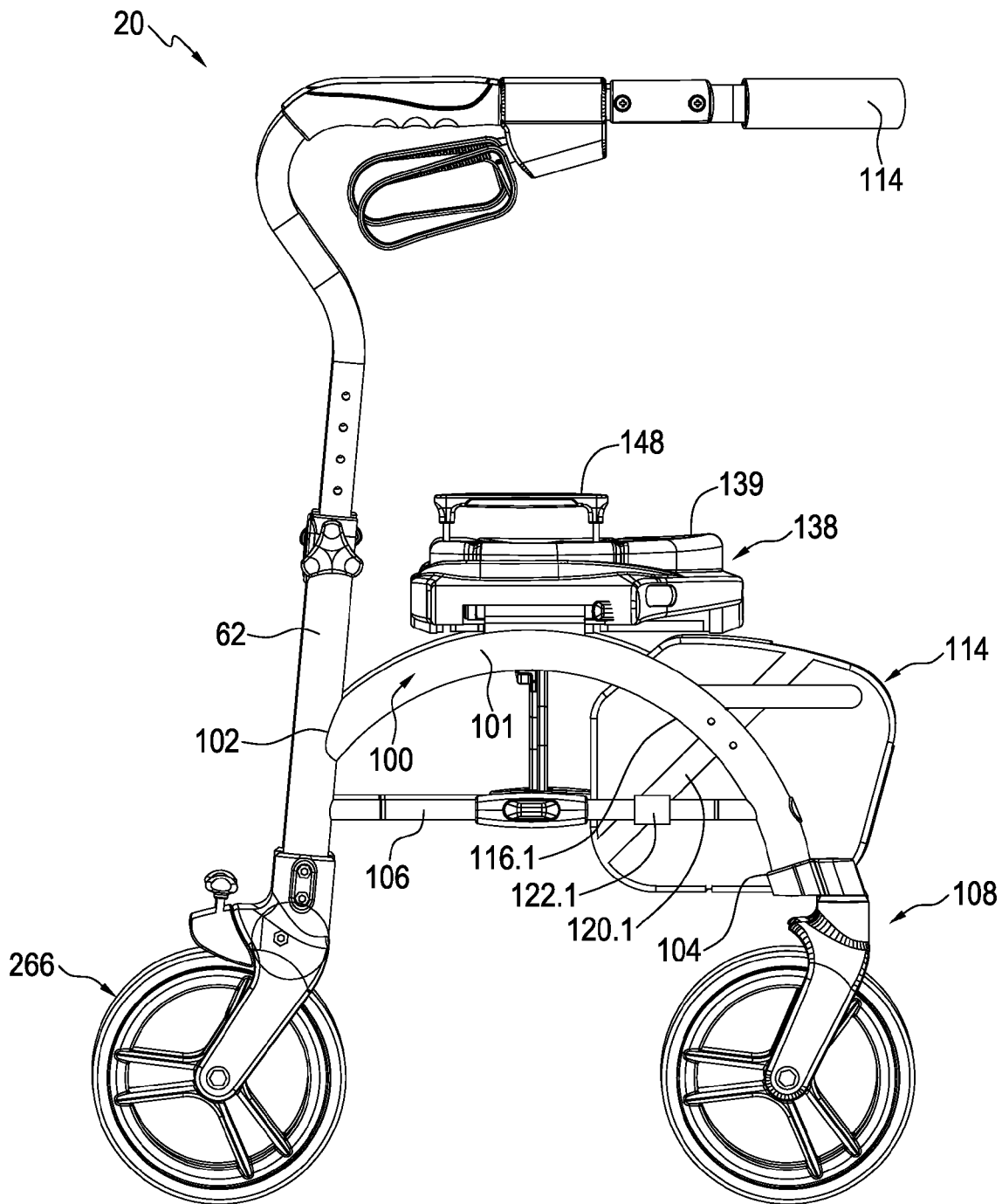


FIG. 2

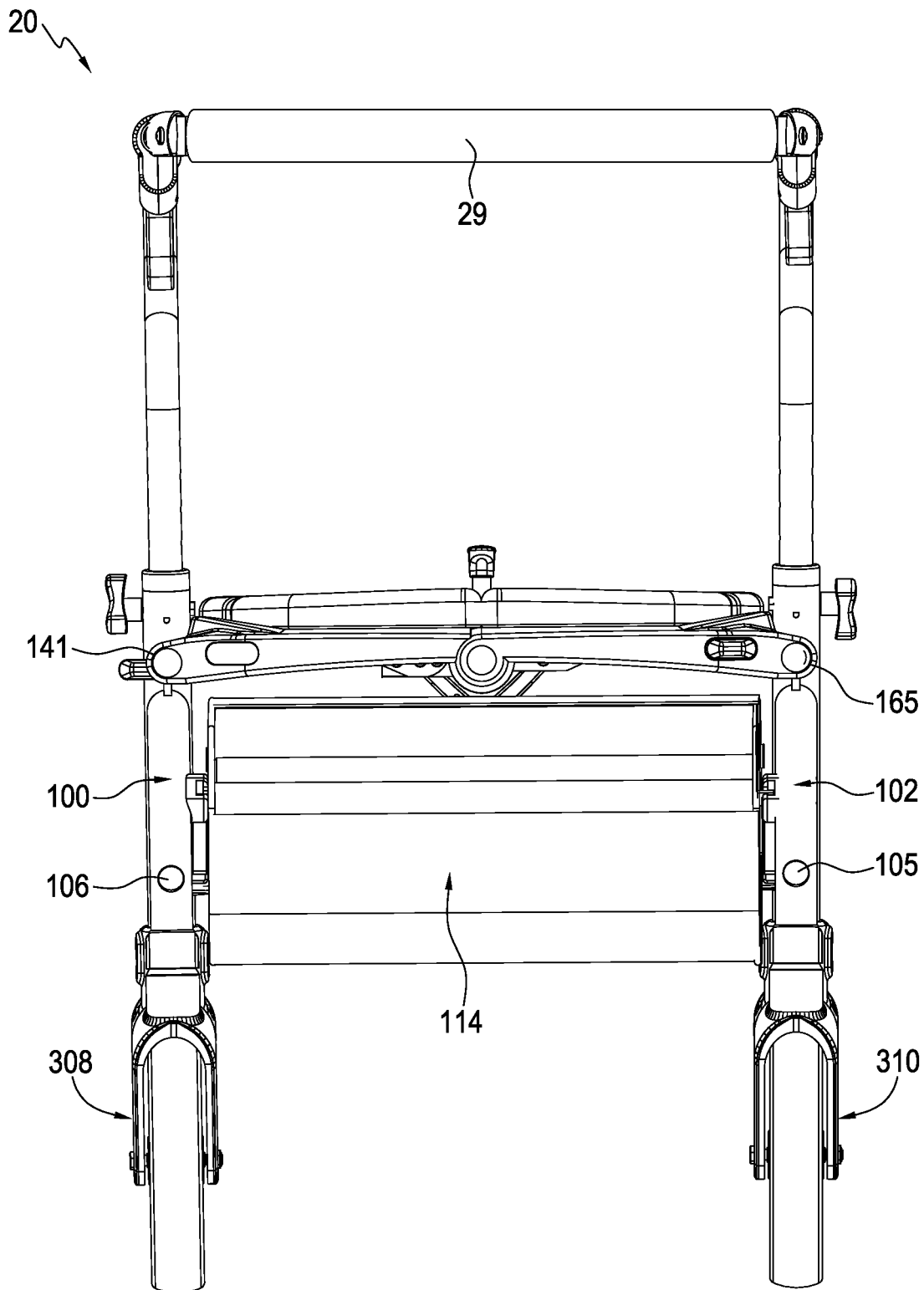


FIG. 3

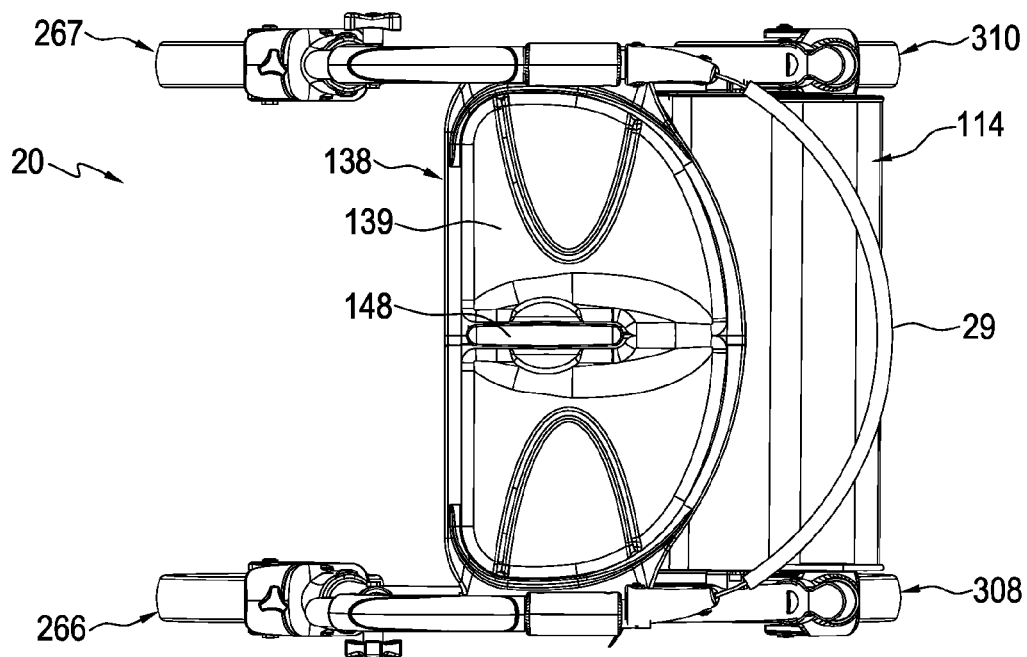


FIG. 4

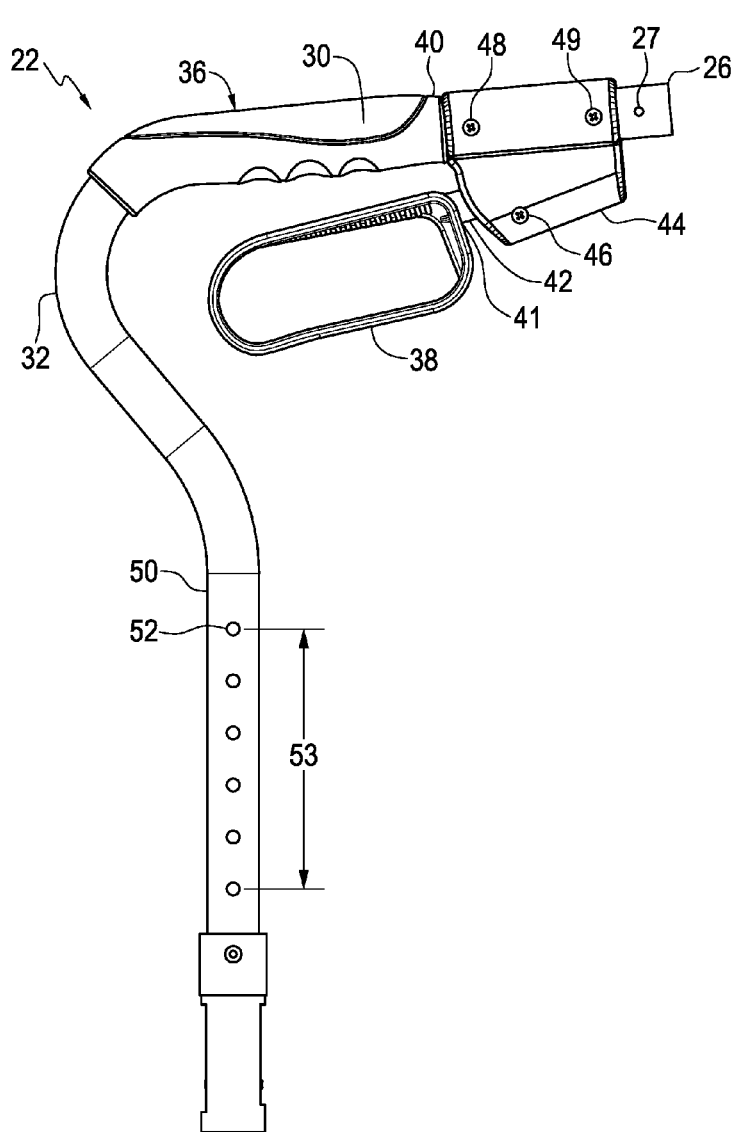


FIG. 5

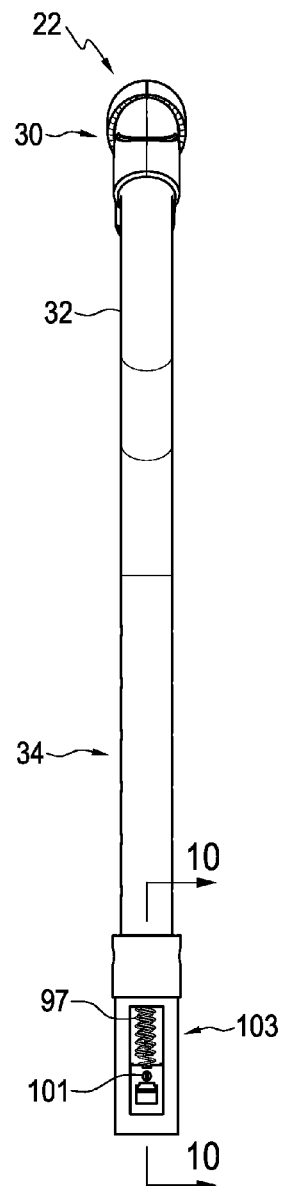


FIG. 6

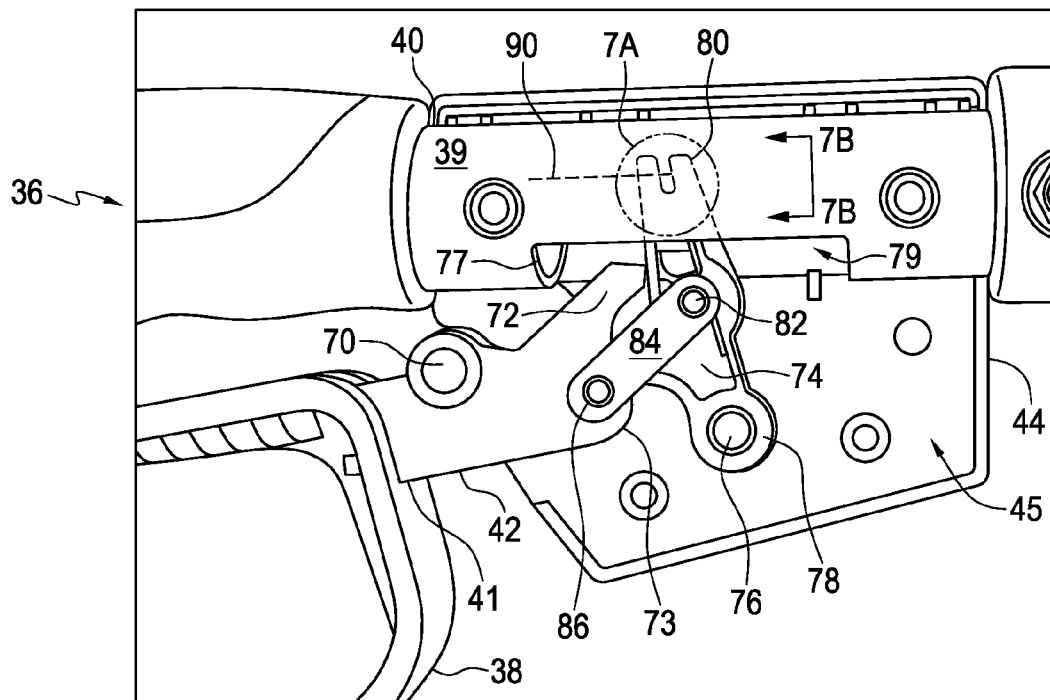


FIG. 7

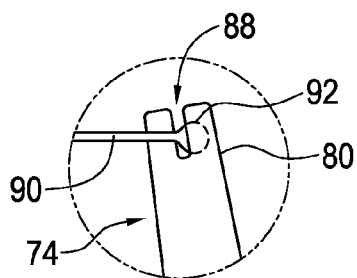


FIG. 7A

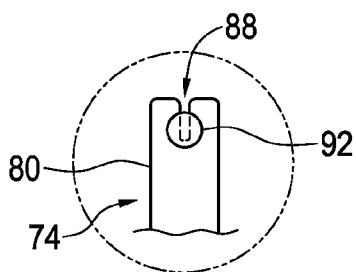


FIG. 7B

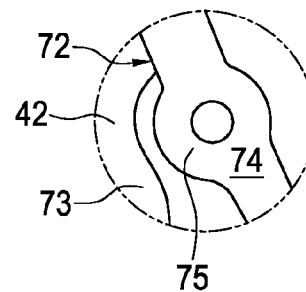


FIG. 7C



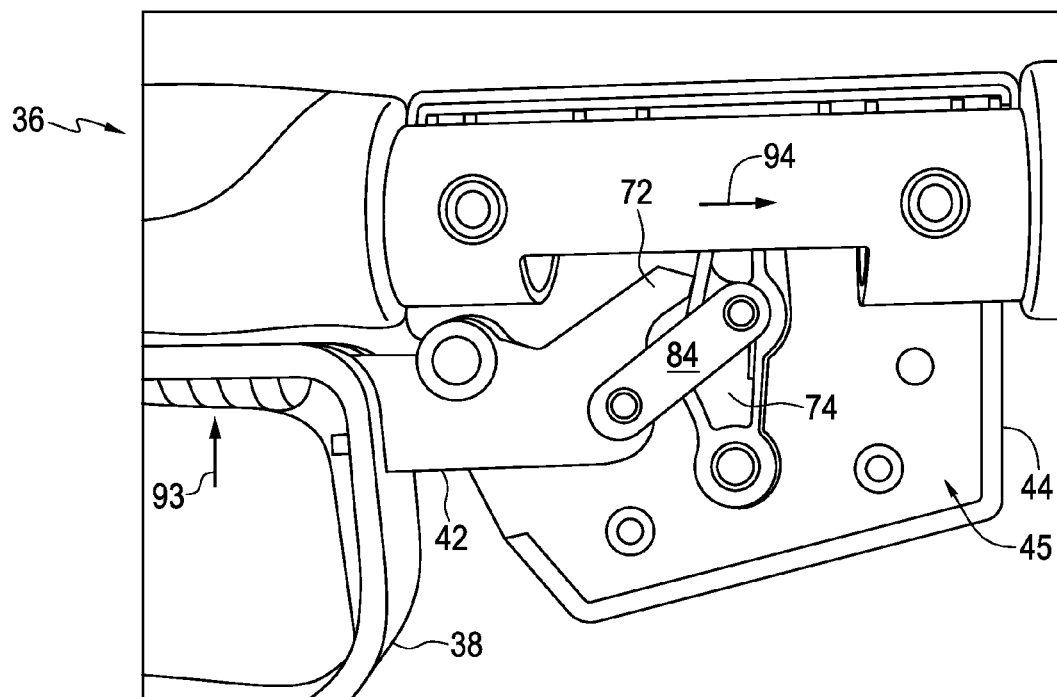


FIG. 8

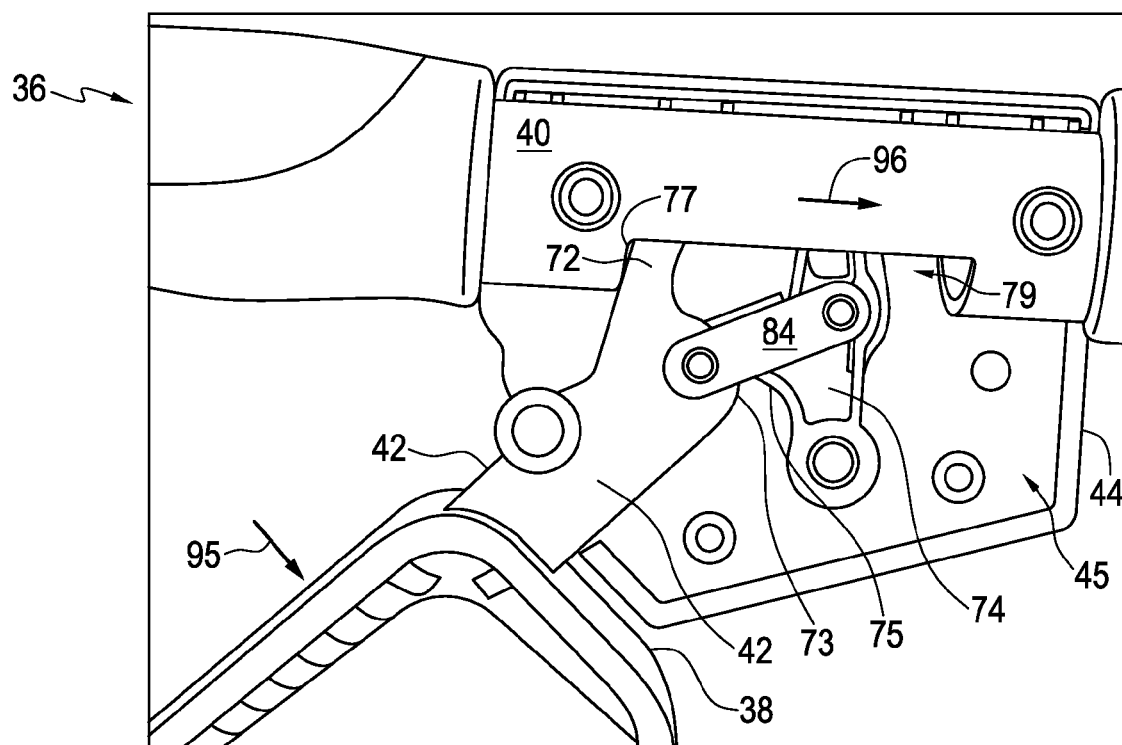


FIG. 9

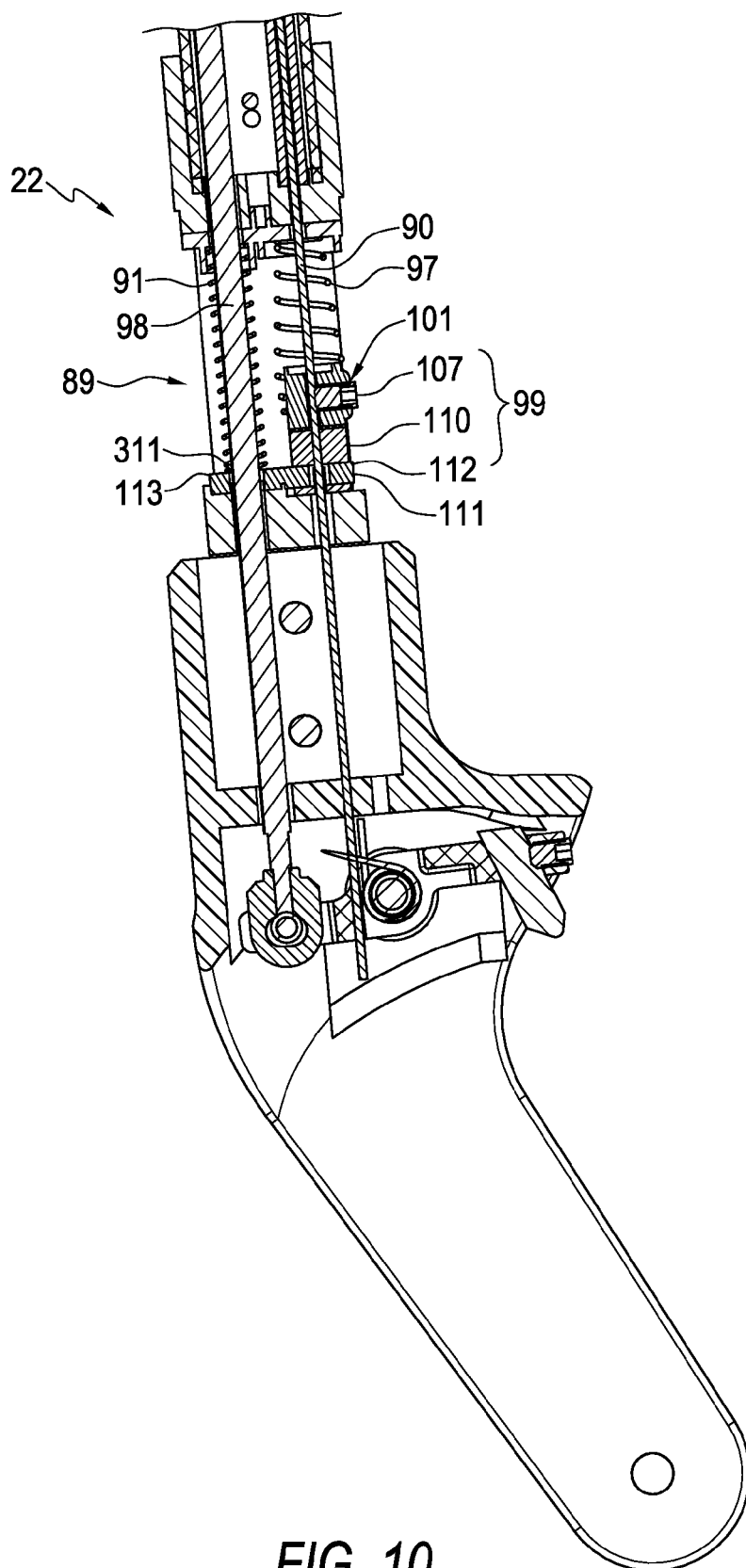
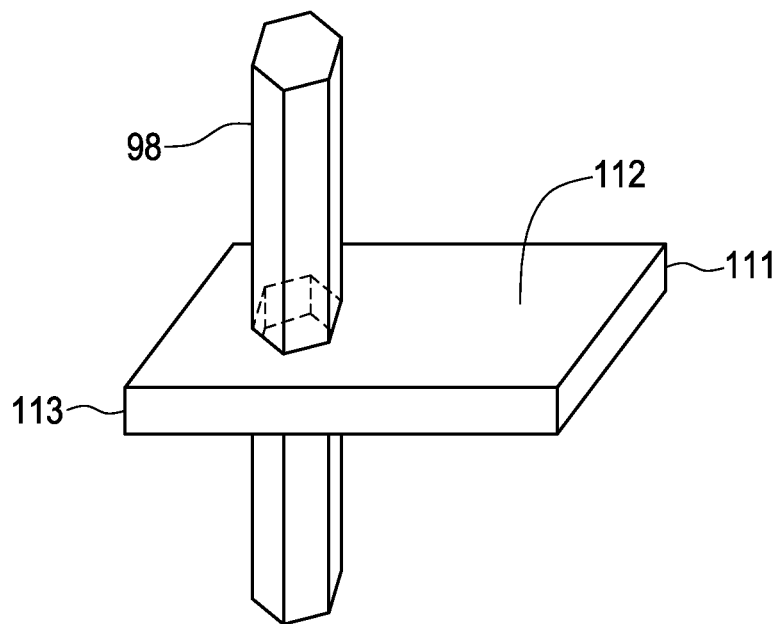
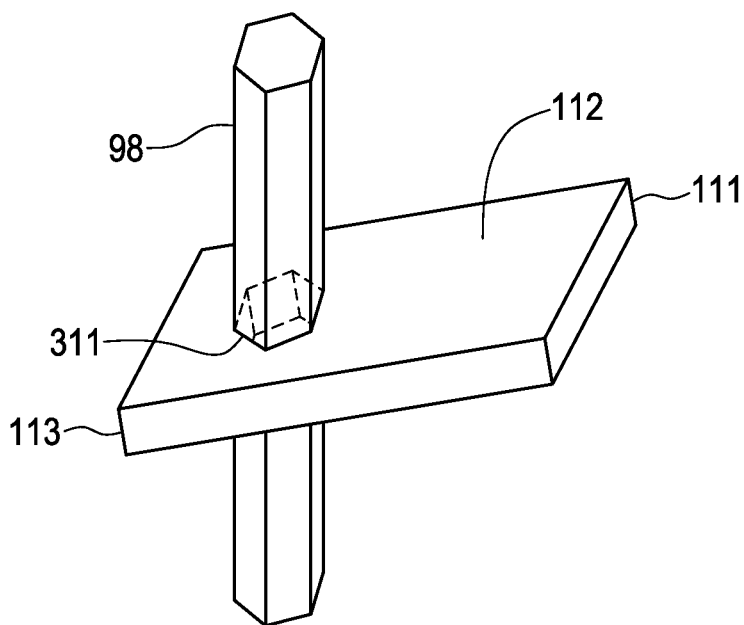


FIG. 10



**FIG. 11**



**FIG. 12**

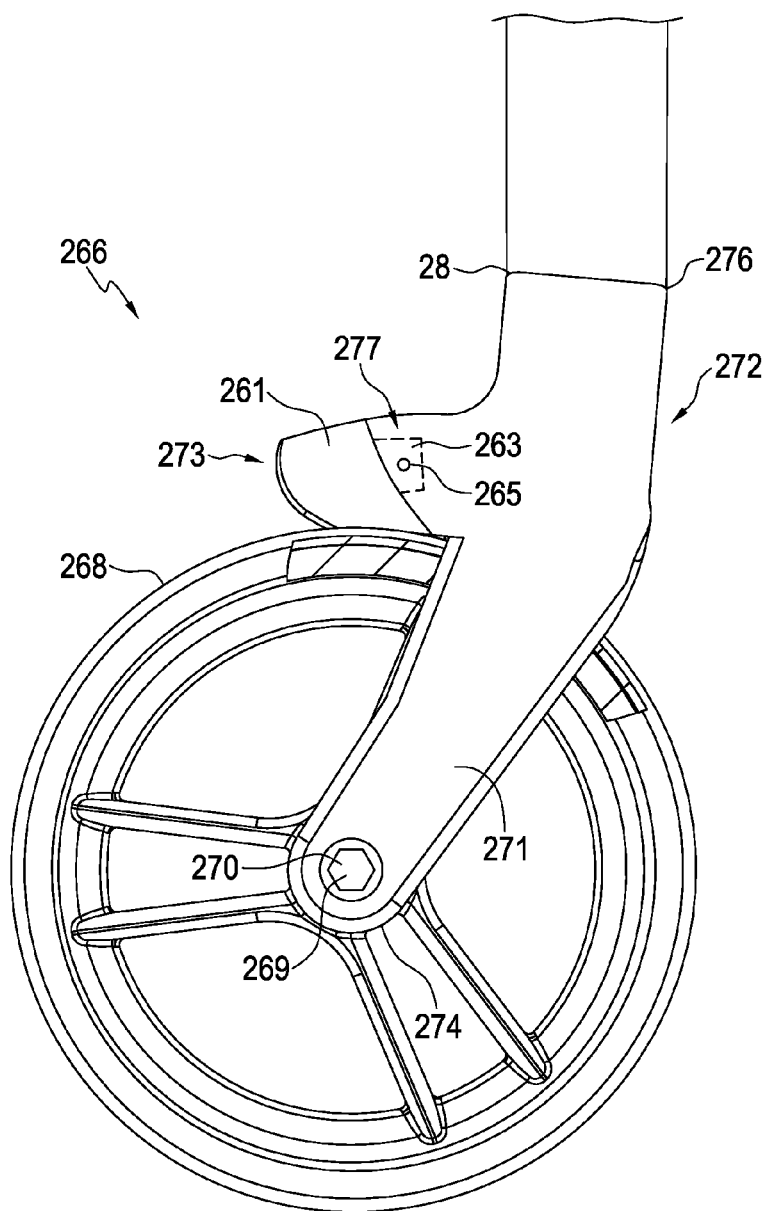


FIG. 13

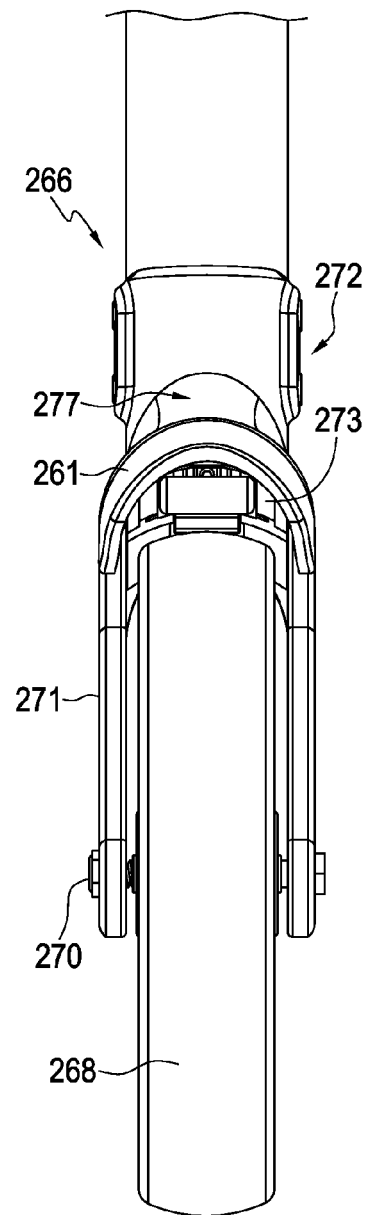
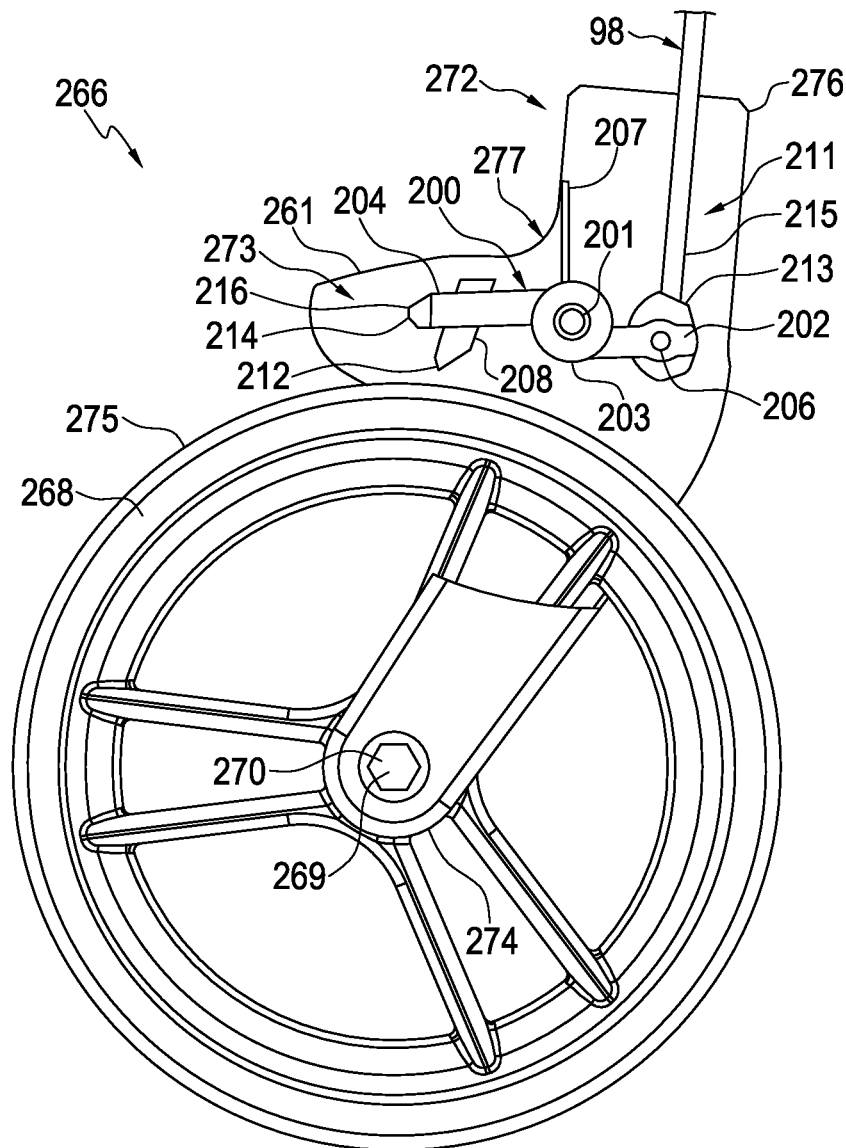


FIG. 14



**FIG. 15**

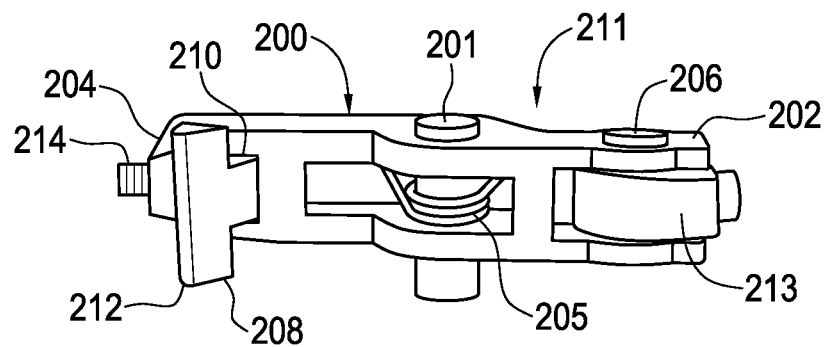


FIG. 16

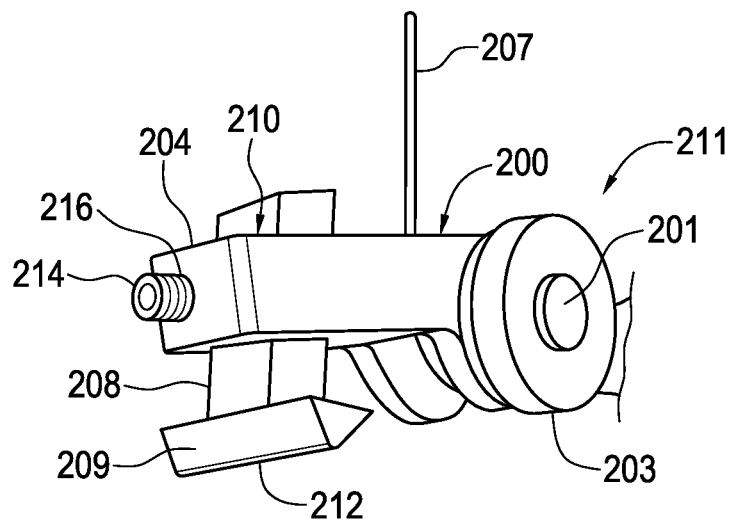
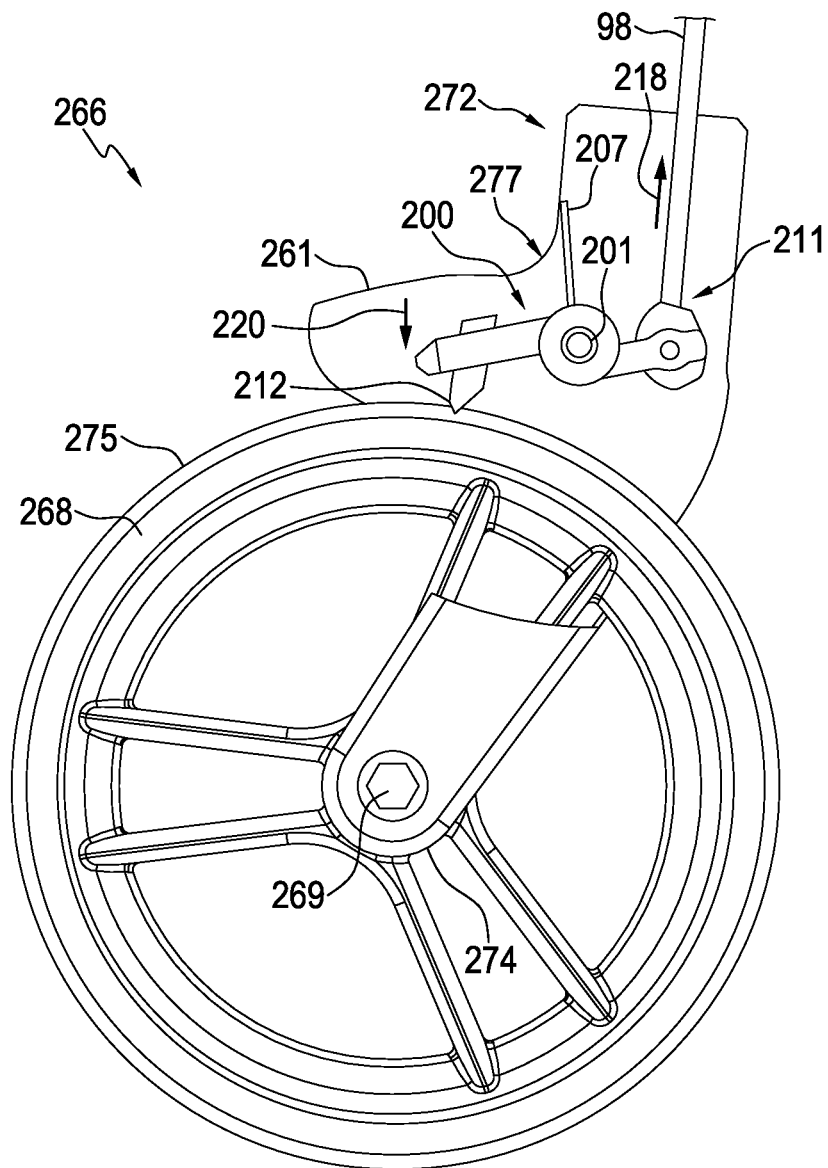
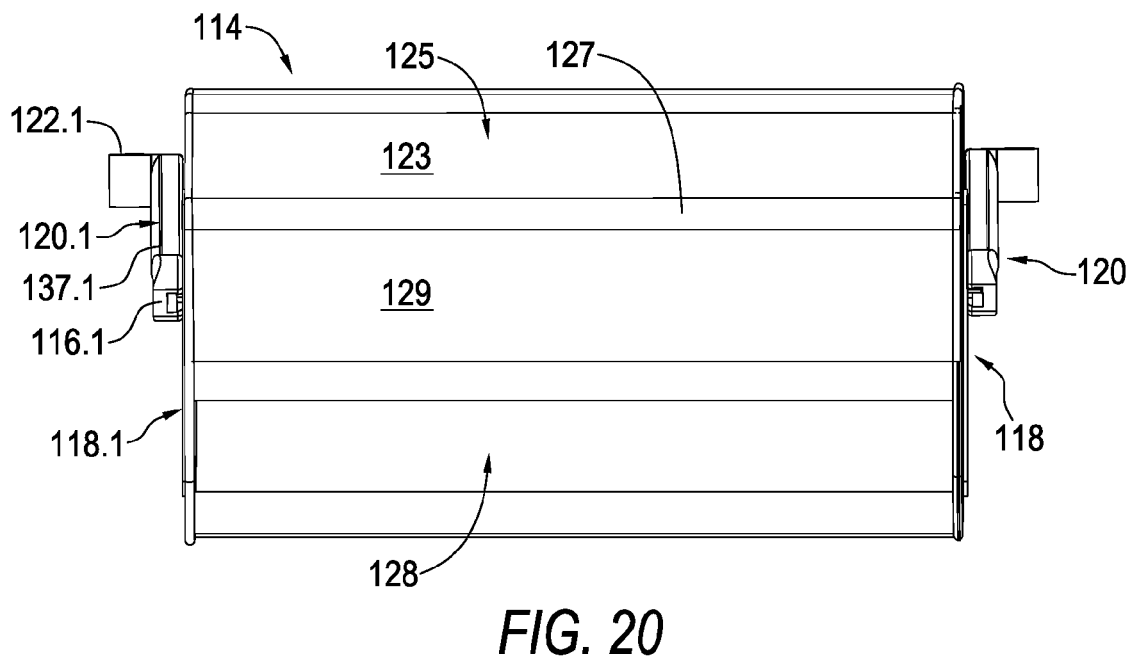
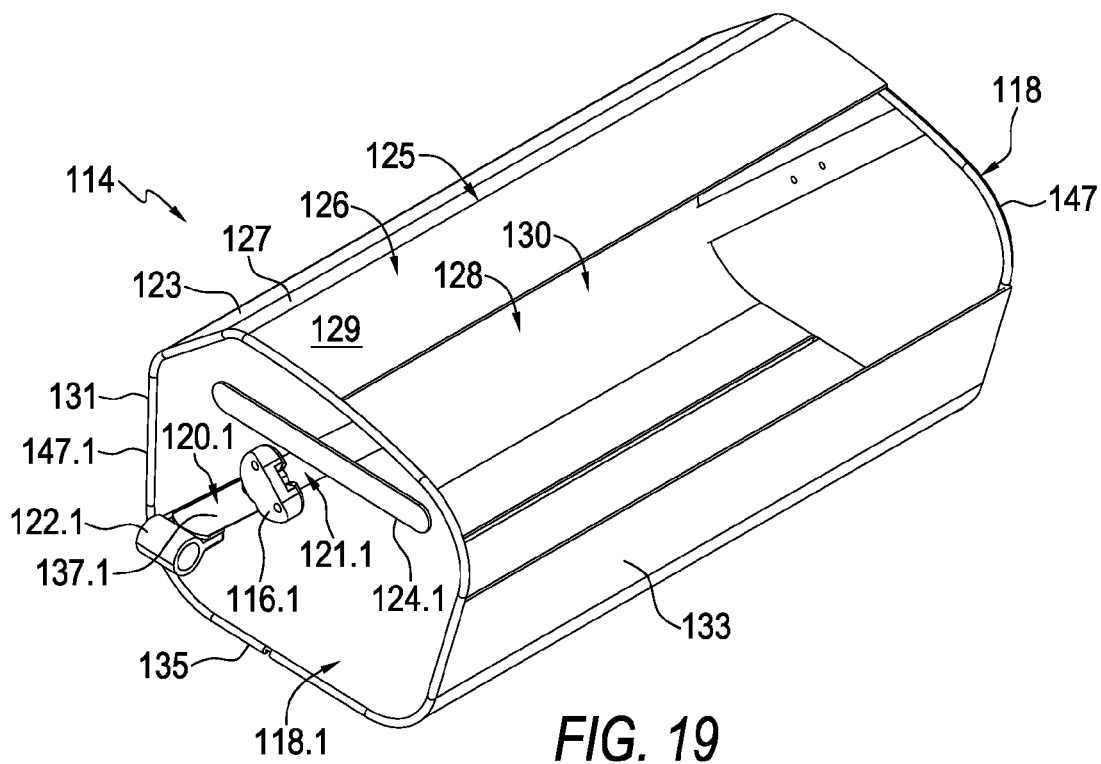


FIG. 17



**FIG. 18**





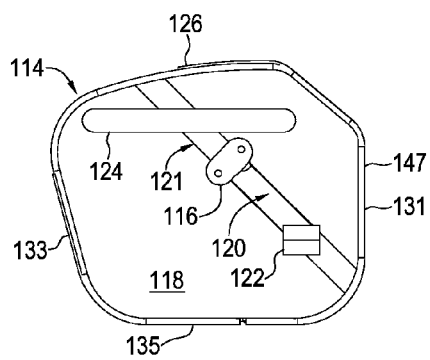


FIG. 22

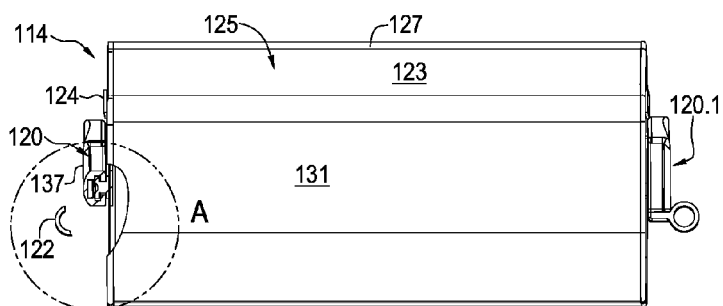


FIG. 21

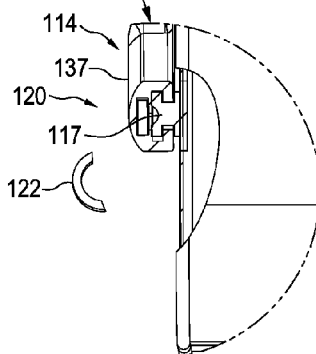


FIG. 21A

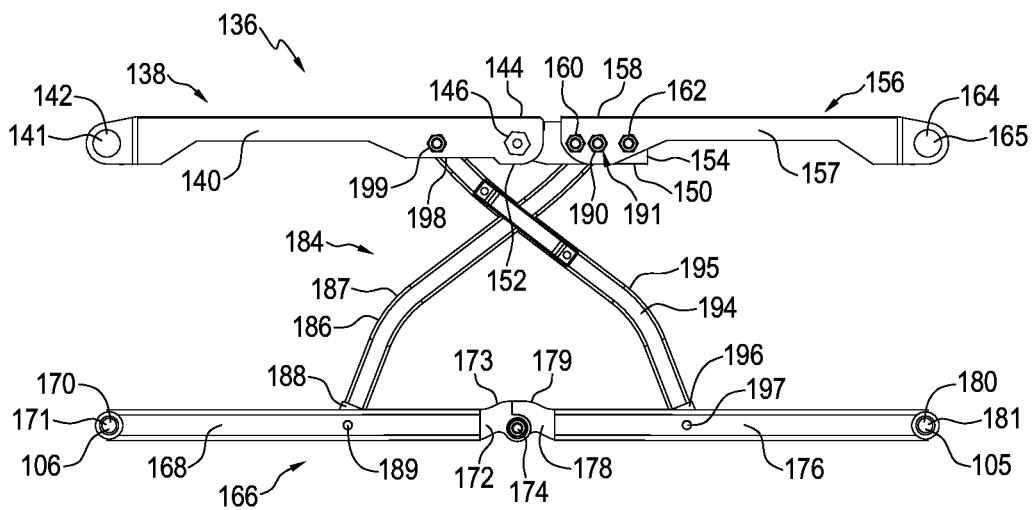


FIG. 23

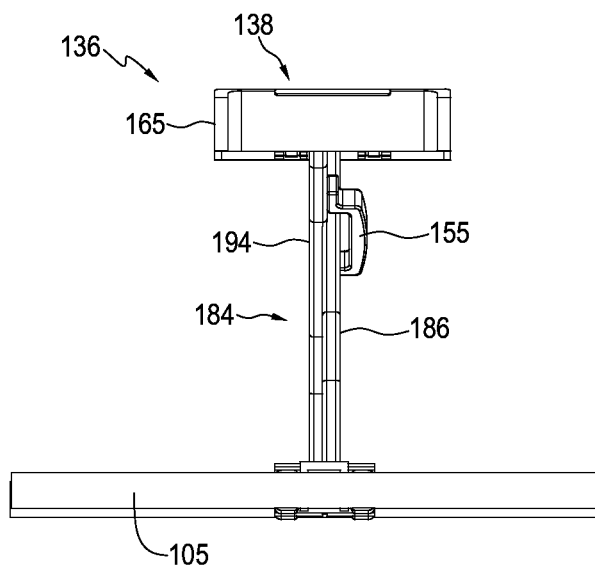


FIG. 24

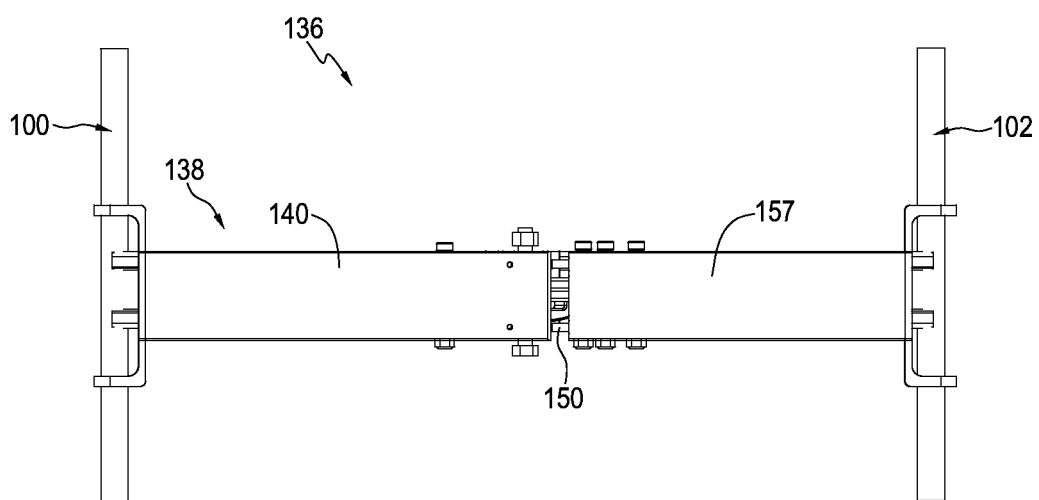


FIG. 25

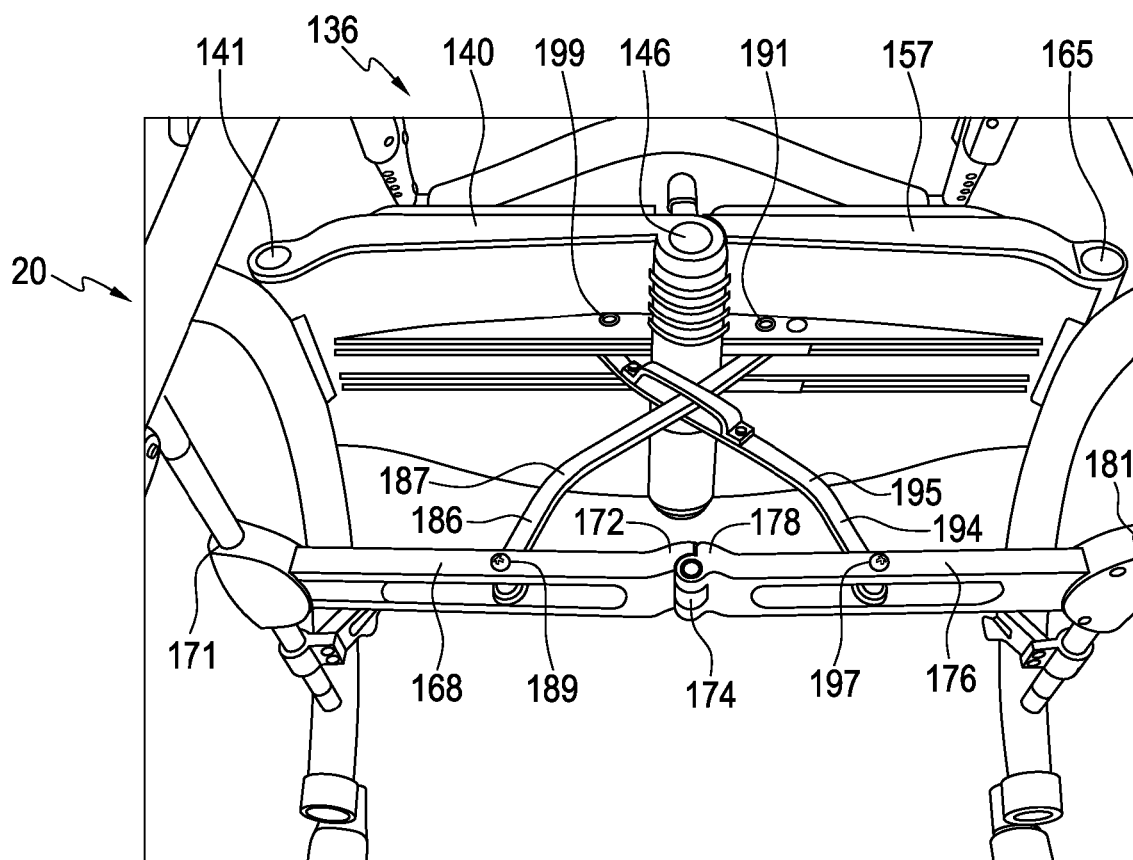


FIG. 26

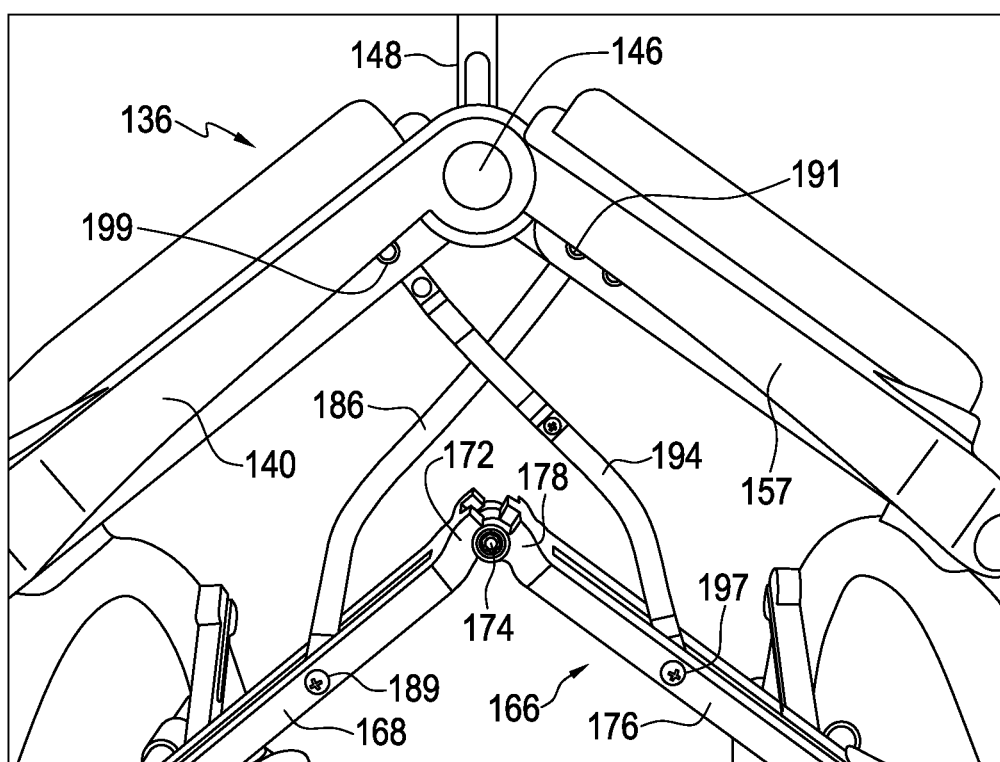


FIG. 27

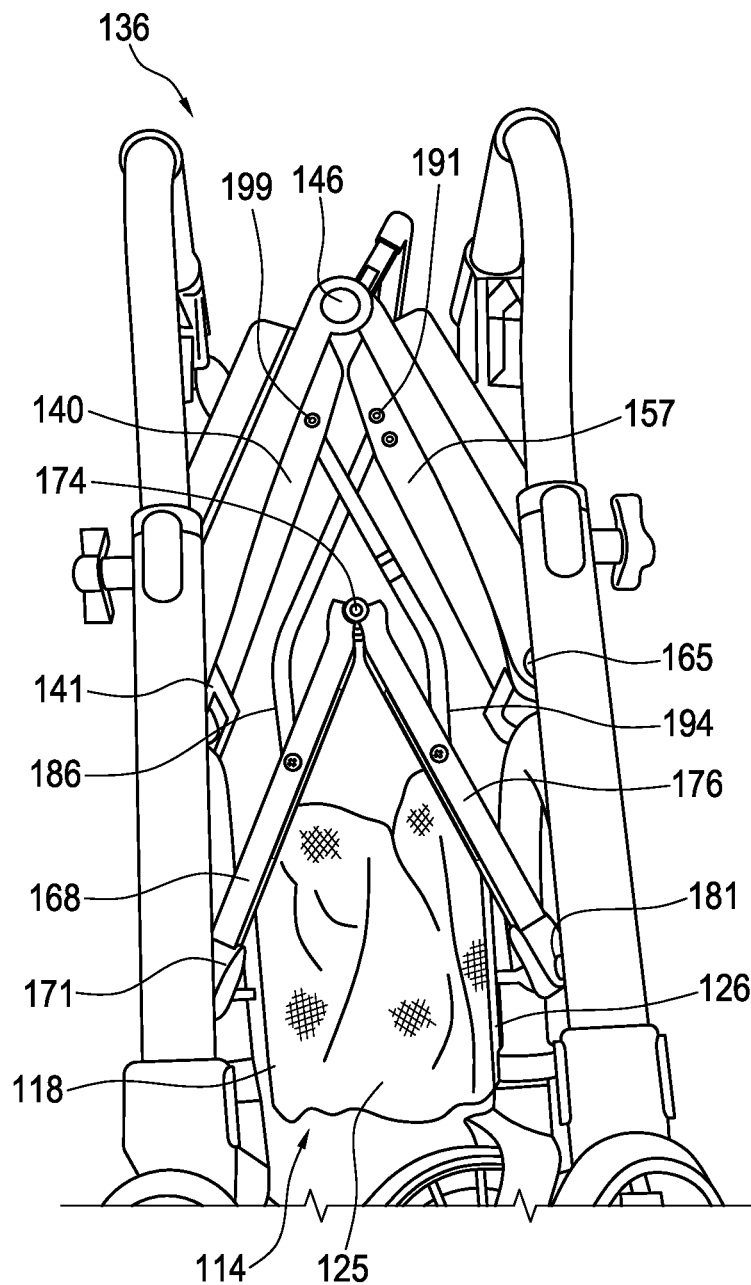


FIG. 28



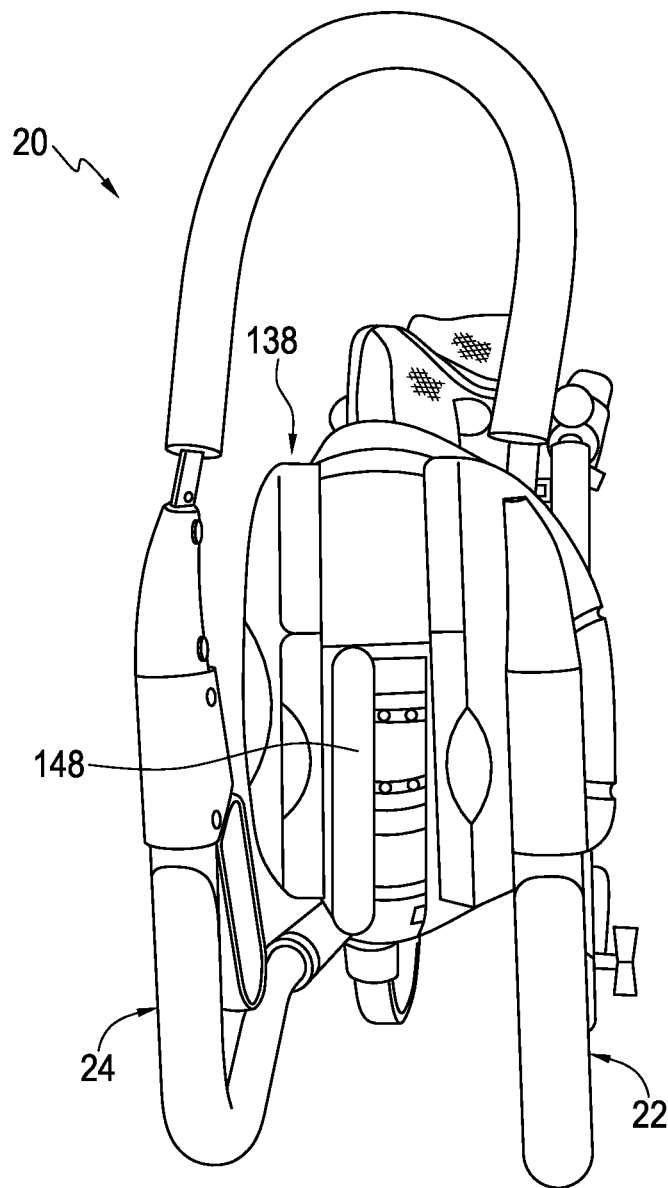


FIG. 29

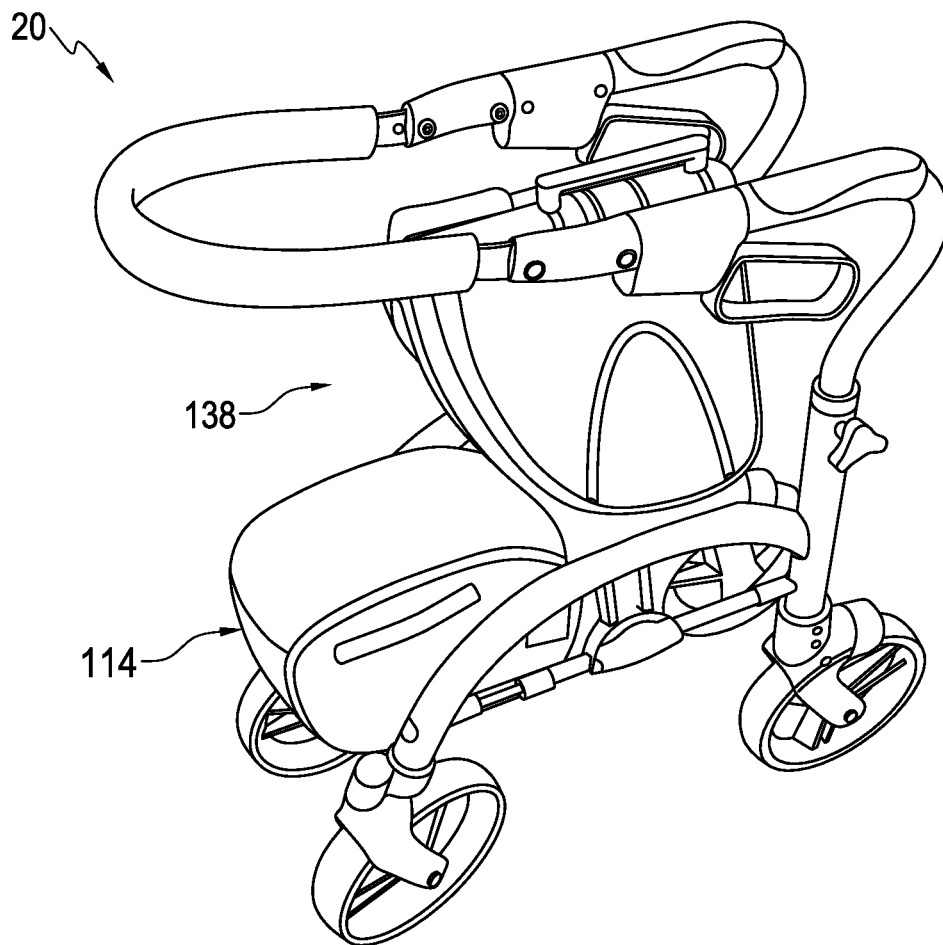


FIG. 30

**FOLDABLE WALKER APPARATUS****CROSS REFERENCE TO RELATED APPLICATIONS**

This application is a continuation of U.S. patent application Ser. No. 13/548,414 filed in the United States Patent and Trademark Office on Jul. 13, 2012, which is a continuation of U.S. patent application Ser. No. 13/276,518 filed in the United States Patent and Trademark Office on Oct. 19, 2011, which is a divisional of U.S. patent application Ser. No. 12/247,781 filed in the United States Patent and Trademark Office on Oct. 8, 2008, the disclosures of which are incorporated herein by reference and priority to which is claimed.

**BACKGROUND OF THE INVENTION****1. Field of the Invention**

The present invention relates to a foldable walker apparatus. More particularly, it relates to a foldable walker apparatus having a variety of optimized features relating to its folding mechanism, braking pad mechanism and brake housing, brake rod assembly, frame shape and collapsible basket.

**2. Description of the Related Art**

It is known to have foldable walkers. However, much of the prior art discloses walkers that require many parts and this may lead to additional manufacturing costs. On the other hand, some walkers have fewer parts but may suffer from a lack of robustness and rigidity, particularly in the lateral direction. This may lead to a compromise in the safety of such devices. Some walkers in their folded states remain bulky and difficult to manage. Still further known walkers suffer from having many parts that may tangle with one's clothing.

There are a great variety of frame shapes for walkers. In order to accommodate the variety of body shapes and circumstances that a user of walkers may encounter, a strong frame is needed. This has led to frames that have many parts, which may lead to further manufacturing costs. Alternatively, this has led to frames that are square or rounded-square in profile which are thicker and/or made of heavy duty metals. Such features may lead to a heavier, less manageable and therefore less enjoyable walker.

Many foldable walkers include baskets. However oftentimes these baskets need to be removed before the foldable walkers may be folded. Alternatively, many of these baskets require the foldable walker to fold from front to back. This may compromise the strength and rigidity of the frame of the foldable walker. Also, many of the baskets for walkers require many parts. This may act to increase manufacturing costs.

A variety of walkers have a housing over the brake pad mechanisms. However oftentimes this housing only partially extends over the brake pad. Even if the brake pad is covered by a housing, often the connecting and adjusting means for adjusting the brake pad protrudes outwards or is exposed for the user to adjust. As a result, some walkers of the prior art have brake pad mechanisms that are more prone to getting entangled with the user of the walker, which may lead to a great inconvenience and a safety concern for the user. Moreover, such walkers are more prone to breaking, and wear and tear, including damage such as thread-stripping of the connecting and adjusting means for the brake pad. This may lead to the considerable inconvenience, and extra expense to the user, or a premature need to replace the brake pad mechanism. It may also lead to a further compromised safety to the user if as a result the walker no longer brakes.

The use of a brake rod for walkers is known. Brake rods provide the advantage of enabling the walker's height to be

adjusted without affecting brake cables disposed within the walker's telescoping tubes. However, some walkers require the two separate steps of 1) adjusting and fixing the height of the telescoping tubes through thumb screws and 2) fixing the brake rod to function accordingly. This is time consuming, requiring additional parts and thus manufacturing costs. It also may require a significant degree of dexterity which may therefore be challenging and therefore frustrating for the user of the walker. Some walkers combine the fixing of the height of the telescoping tubes with the fixing of the brake rods. However such walkers require that the length of the telescoping tubes be first fixed by the user in order to enable the brake rods to function. Therefore, if the user does not have the dexterity to fix the height of the telescoping tubes, or if the fixing mechanism for the telescoping tubes malfunctions or no longer works through damage or wear and tear, such as a stripping of the thumb screw, this means that the brake rod cannot be fixed and the braking function of the walker will not work. This may result in a walker braking mechanism that is less robust and less safe.

**BRIEF SUMMARY OF INVENTION**

An object of the present invention is to provide an improved walker apparatus that overcomes the above disadvantages.

More particularly, the present invention provides a brake rod assembly for a walker apparatus. The assembly includes a brake rod operatively connected to a brake for braking the walker apparatus. The assembly includes a connection member operatively connected to a brake handle. The assembly includes a gripping member that is spring-biased to slidably receive the brake rod. The gripping member has an adjustment mechanism rigidly connected thereto that adjustably engages a connection member. Actuation of the connection member tilts the gripping member upwards and engages the brake rod for braking the walker apparatus.

**BRIEF DESCRIPTION OF DRAWINGS**

The invention will be more readily understood from the following description of preferred embodiments thereof given, by way of example only, with reference to the accompanying drawings, in which:

FIG. 1 is a top, front isometric view of a walker apparatus, according to one embodiment of the invention;

FIG. 2 is a side elevation view of the walker apparatus of FIG. 1;

FIG. 3 is a front elevation view of the walker apparatus of FIG. 1;

FIG. 4 is a top plan view of the walker apparatus of FIG. 1;

FIG. 5 is a side elevation view of part of an outer frame member including a handle bar assembly, according to one embodiment of the invention;

FIG. 6 is a rear elevation view of the part of the outer frame member of FIG. 5;

FIG. 7 is a partial, side elevation view of the interior of the handle bar assembly including a handle in a non-actuated mode;

FIG. 7A is an enlarged up, side elevation view of a lever and brake wire connected thereto for the handle bar assembly of FIG. 7;

FIG. 7B is an enlarged view along lines 7B-7B of FIG. 7 illustrating the lever and brake wire connected thereto;

FIG. 7C is an enlarged, partial view of FIG. 7 showing a projection from a first handle lever and an adjacent projection from a second handle lever.

FIG. 8 is a partial, side elevation view similar to FIG. 7 with the handle is an actuated brake mode;

FIG. 9 is a partial, side elevation view similar to FIG. 7 with the handle is an actuated park mode;

FIG. 10 is a side partial view of the outer frame member in section along lines 10-10 of FIG. 6 to illustrate a brake rod assembly according to one embodiment of the invention;

FIG. 11 is an enlarged, partial elevation view of the brake rod with a gripping member according to one embodiment of the invention slidably connected thereto in a non-actuated mode;

FIG. 12 is an enlarged, partial elevation view similar to FIG. 11 with the gripping member engaging the brake rod in an actuated mode;

FIG. 13 is a side elevation view of a wheel assembly illustrating a brake housing according to one embodiment of the invention;

FIG. 14 is a rear elevation view of the wheel assembly and brake housing;

FIG. 15 is a side elevation view similar to FIG. 13 with the brake housing partially in section to illustrate a brake pad assembly in a non-actuated mode;

FIG. 16 is bottom plan view of the brake pad assembly of FIG. 15;

FIG. 17 is a rear perspective view of the brake pad assembly of FIG. 16 illustrating a brake pad and a means for fixing and adjusting the brake pad;

FIG. 18 is a side elevation view similar to FIG. 15 illustrating the brake pad assembly in an actuated mode with the brake pad engaging the wheel;

FIG. 19 is a top, front isometric view of a collapsible basket according to one embodiment of the invention;

FIG. 20 is a top plan view of the collapsible basket of FIG. 19;

FIG. 21 is a rear elevation view of the collapsible basket of FIG. 19;

FIG. 21A is an enlarged view of FIG. 21 illustrating a connection bracket and an insert shaped to be received by the connection bracket for thereby mounting the collapsible basket;

FIG. 22 is side elevation view of the collapsible basket of FIG. 19;

FIG. 23 is a front elevation view of a folding mechanism in an extended mode, according to one embodiment of the invention;

FIG. 24 is a side elevation view of the folding mechanism of FIG. 23;

FIG. 25 is a top plan view of the folding mechanism of FIG. 23 in the extended mode;

FIG. 26 is a rear, bottom perspective view of the folding mechanism in the extended mode together with the walker apparatus;

FIG. 27 is a rear elevation view of the folding mechanism of FIG. 26 in a partially folded mode;

FIG. 28 is a rear elevation view of the folding mechanism and walker apparatus in a fully folded mode;

FIG. 29 a top plan view of the walker apparatus illustrated in FIG. 28 in the fully folded mode; and

FIG. 30 a top, front isometric view of the walker apparatus in the fully mode.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings and first to FIGS. 1 to 4, there is provided a walker apparatus in this example a foldable walker apparatus 20. The walker apparatus 20 includes a pair of

upright, spaced-apart elongate members or outer frame members 22 and 24. As shown in FIG. 1, outer frame member 22 has an upper end 26 and a lower end 28 spaced-apart therefrom. A screw 27 located adjacent to the upper end connects to a backrest member 29. The same applies for outer frame member 24 and the backrest member 29 thereby connects the outer frame members 22 and 24 together at their upper ends. Each of the outer frame members has substantially the same parts and performs substantially the same functions and therefore only outer frame member 22 will be discussed in detail.

FIG. 5 shows part of the outer frame member 22 including a straight portion 40 with a handle bar assembly 36 extending outwards therefrom adjacent the upper end 26. The handle bar assembly 36 includes a grip pad 30 extending along the straight portion 40. The handle bar assembly 36 includes a handle bar housing 44 comprised of two halves secured together and secured to the straight portion 40 via screws 46, 48 and 49. The handle bar assembly 36 also includes a first handle lever 42 having a first end 41 with an actuator, in this example a braking or gripping handle 38, extending therefrom. The handle bar assembly 36 is illustrated in greater detail in FIGS. 7 to 9 where one half of the handle bar housing 44 is partially removed to show an interior 45 of the handle bar housing 44.

Referring first to FIG. 7, this shows the handle bar assembly in a non-actuation mode. The first handle lever 42 is pivotally mounted via pivot 70 to the handle bar housing 44. The first handle lever 42 has a second end 72 spaced-apart from the first end 41. The first handle lever 42 includes a projection 73 interposed between the first end 41 and the second end 72. The second end 72 is positioned to be engageable a second handle lever 74.

The second handle lever 74 is pivotally mounted to the handle bar housing 44 via pivot 76 at a first end 78 of the second handle lever 74. The second handle lever 74 has a second end 80 spaced-apart from the first end 78. A link 84 pivotally connects together the first handle lever 42 to the second handle lever 74 via pivot 86 which is between ends 41 and 72 of the first handle lever, and pivot 82 which is between ends 78 and 80 of the second handle lever. The first handle lever 42, the second brake lever 74 and the link 84 so configured and connected to the housing may collectively be referred to as an actuation means for actuating a connection member or brake wire 90 when the gripping handle 38 is squeezed. As shown in FIG. 7C, the second handle lever 74 has a projection 75 between the first end 78 and the second end 80 that extends towards the projection 73 of the first handle lever 42. These are shown in FIG. 7C with the link 84 removed. Referring FIG. 7, the second end 80 of the second handle lever 74 extends within and is moveable within a recess 79 of a body 39 of the straight portion 40 of the outer frame member. An edge 77 is interposed between the body 39 and recess 79.

Referring to FIGS. 7A and 7B which show partially within the recess 79, the second end 80 includes a slot 88. The brake wire 90 is connected to the second handle lever 74 through a nipple 92 extending from the brake wire 90 and that slidably engages with the slot 88.

The handle bar assembly 36 may be positioned in an actuated, braking mode as shown in FIG. 8. When the gripping handle 38 is actuated or pulled upwards from the perspective of FIG. 8 as indicated by arrow 93, this causes the second end 72 of the first handle lever 42 to forcibly abut against and push the second handle lever 74 to the right, from the perspective of FIG. 8 as indicated by arrow 94. This thereby causes the brake wire 90 to be actuated.

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The handle bar assembly 36 may be positioned in an actuated, parking mode as shown in FIG. 9. When the gripping handle is actuated or pushed downward from the perspective of FIG. 9, this causes the first end 72 of the first handle lever 42 to move within the recess 79 and abut against edge 77. Also, the projection 73 of the first handle lever 42 is caused to forcibly abut with the projection 75 of the second handle lever 74. The first handle lever 42 is thereby held in place by being wedged between the edge 77 of the straight portion 40 and the projection 75. The abutment of the projection 73 against projection 75 thereby causes the second handle lever 74 to move to the right from the perspective of FIG. 9 as indicated by arrow 96 and thereby actuate the brake wire 90.

Referring back to FIGS. 5 and 6, the frame member 22 has a bend 32 extending from the straight portion 40. Referring to both FIG. 1 and FIG. 5, the bend 32 extends to telescoping tubes 60 which include inner tube 50 and outer tube 62 shaped to receive the inner tube 50. The straight portion 40, the bend 32 and telescoping tubes 60 together provide a rounded L-shape for the outer frame member 22. Tube 50 has a plurality of spaced-apart apertures 52 which define an adjustment range 53, as shown in FIG. 5. A means for locking the telescoping tubes together, in this example a thumb screw 66, shown in FIG. 1, may be inserted through one of said apertures to fixedly adjust the height of the telescoping tubes 60, as is well known to those skilled in the art. This thereby enables the height of the walker apparatus to be adjusted to provide an optimized height for the user.

FIG. 10 shows part of the outer frame member 22 partially in section to reveal a brake rod assembly 89. The brake rod assembly 89 includes a brake rod 98 which extends within inner tube 50 of FIG. 5. The brake rod 98 in this example has a hexagonal cross-section. A resilient member, in this example coil spring 91 extends about the brake rod 98. A gripping member 99 is adjacent to and is slidably engageable with the brake rod 98 along a distance equal to the adjustment range 53 of FIG. 5. The gripping member 99 in this example includes a clamp 101 that adjustably engages with the brake wire 90 via an adjustment mechanism, in this example set screw 107. As seen in FIG. 6, tube 50 has an aperture 103 through which clamp 101 is accessible. A resilient member, in this example coil spring 97 wraps around brake wire 90 above the clamp 101 from the perspective of FIG. 10. The coil spring 91 and the coil spring 97 bias the gripping member 99 downwards, from the perspective of FIG. 10, towards a non-actuated mode. The gripping member 99 also includes a block member 110 and coupling plate 112, in this example a metal plate, that receive the brake wire 90 near a first end 111 of the metal plate, which is also an end of the gripping member. As seen in FIG. 10, the block member is interposed between and connects the coupling plate to the set screw 107, the set screw thus rigidly connecting to the rest of the gripping member, forming a unitary structure with the coupling plate as seen in FIG. 10 and being positioned above the coupling plate. As seen in FIG. 10, coil spring 97 biases the plate near the first end of the plate. The metal plate 112 has an aperture 311 near a second end 113 of the metal plate, which is also an end of the gripping member, spaced-apart from the first end 111. The brake rod 98 passes through the aperture 311. The metal plate 112 is slidably engageable with the brake rod 98. As seen in FIG. 10, coil spring 91 biases the plate near the second end 113 of the plate.

FIG. 11 shows the metal plate 112 and the brake rod 98 of FIG. 10 in isolation. The metal plate 112 slidably receives the brake rod 98 in a non-actuated mode. The brake wire 90 is operatively connected adjacent to the first end 111 as seen in FIG. 10. When the brake wire 90 is actuated or pulled

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upwards from the perspective of FIGS. 10 and 11, the first end 111 of the metal plate moves upward as indicated by FIG. 12. The plate is thereby caused to tilt, with a portion thereof adjacent to the aperture 311 abutting and engaging the brake rod 98. The metal plate 112 thereby is able to grip the brake rod 98. The brake wire 90 continues to be pulled upwards when actuated and this causes the metal plate, and in turn, the brake rod 98, to move upwards in unison with the brake wire 90.

Referring back to FIG. 1, a first pair of wheel assemblies 266 and 267 are rotatably mounted to the outer frame members 22 and 24. In this example both wheel assembly 266 and wheel assembly 267 are structurally and functionally the same. Accordingly, only wheel assembly 266 will be discussed in detail.

Referring to FIGS. 13 and 14, the wheel assembly 266 includes a brake pad assembly 272. The brake pad assembly 272 has a proximal end 276 that connects to the lower end 28 of the outer frame member 22. The brake pad assembly 272 has a bracket housing 271 that receives a ground-engaging wheel 268 at a distal end 274 of the brake pad assembly which is spaced-apart from the proximal end 276. An aperture 270 near the distal end 274 connects to the wheel 268 via a wheel axis 269. The brake pad assembly 272 includes a brake housing 277 between the proximal end 276 and the distal end 274. The brake housing 277 extends overtop of and along at least a portion of the wheel 268 and includes an interior 273. The brake housing 277 includes a removable covering portion 261 that has an inner portion 263 within the interior 273 and which connects to the rest of the brake housing by means of a screw 265 which is Allen key removable in this example.

FIG. 15 shows the wheel assembly 266 with the brake housing 277 partially removed to show the interior 273. The brake pad assembly 272 includes a brake pad mechanism 211 located within the interior 273. The brake pad mechanism 211 includes a brake pad lever 200 pivotally mounted to the brake housing 277 via pivot rod 201 as best shown in FIG. 16. Bushings 203 on both ends of the pivot rod 201 are interposed between the brake pad lever 200 and the brake housing 277. A spring 205 is coiled around the pivot rod 201 and, as shown in FIG. 17, includes an outer portion 207 that extends outwardly away from the brake pad lever 200. The brake pad lever 200 has a first end 202 with a pivot 213 that connects to the brake rod 98. The brake pad lever 200 also has a second end 204 which is opposite the first end 202.

A brake pad 212 is located near the second end 204. As best shown in FIG. 17, it includes an elongate part 208 that is slidably insertable within a slot 210. The brake pad 212 extends outwards from the slot 210 towards an outer periphery 275 of the wheel 268 shown in FIG. 18. The brake pad 212 includes a contact part 209 extending parallel to the wheel axis 269 shown in FIG. 15 for engaging the wheel 268. The brake pad 212 as a result is T-shaped in this example.

The brake pad mechanism 211 includes a means 214 for connecting the brake pad 212 within the slot 210 and for adjusting the position of the brake pad 212 relative to the wheel 268. The means 214 for connecting and adjusting is located at the second end 204 of the brake pad lever 200, as best shown in FIG. 17. In this example, the means for connecting and adjusting 214 is an Allen key adjustable screw that passes through aperture 216 to releasably abut the elongate part 208 of the brake pad 212. Referring to FIG. 15, the covering portion 261 is adjacent to the means 214 for connecting and adjusting. The brake housing 277 extends around the brake pad mechanism 211, including the means 214 for connecting and adjusting, to at least the outer periphery 275 of the wheel 268 for fully protecting the brake pad mechanism

211 thereby. Advantageously, the means 214 for connecting and adjusting is accessible upon removal of the covering portion 261.

The brake pad lever 200 is spring-biased via the outer portion 207 of the spring 205, which abuts against the brake housing 277 as shown in FIG. 15, to position the brake pad 212 spaced-apart from and adjacent to the outer periphery 275 of the wheel 268.

In operation, to brake the walker apparatus, the braking handle is either pulled upwards in the direction of arrow 93 for braking as shown FIG. 8 or pushed downwards for parking as shown in FIG. 9. Either of these actions operatively actuates the brake wire 90, which in turn actuates the gripping member 99 to engage or actuate the brake rod 98, as shown in FIG. 12. When brake rod 98 is actuated or moved upward from the perspective of FIG. 18, the brake pad lever 200 causes the brake pad 212 to engage the wheel 268 for inhibiting rotation of the wheel.

Referring back to FIG. 1, the walker apparatus 20 has a second pair of ground-engaging wheel assemblies 308 and 310. These wheel assemblies 308 and 310 are similar to wheel assemblies 266 and 267 with the exception that they do not include brake pad assemblies or mechanisms.

A pair of spaced-apart support members 100 and 102 connect together the first and second pair of wheel assemblies, as best shown in FIGS. 1 and 3. Each support member is the substantially the same and has the same structure and function. Only support member 100 will be discussed in detail. Support member 100 aligns with and extends from the tube 62 of the outer frame member 22 to a distal end 104 of the support member which connects to wheel assembly 308. The support member 100 is arc-shaped and partially circular. The support member 100 has an apex 307. The apex 307 is the most elevated point of the support member 100 from the perspective of FIG. 1. The apex extends towards the upper end 26 of the elongate member 22. A seat 139 for resting, which includes an extendable and retractable seat handle 148, connects to the apexes of the support members. The support members thereby support the seat 139. A rod 106 extends from the tube 62 of the outer frame member 22 to near the distal end 104 of the support member 100. The same applies with respect to rod 105 for corresponding support member 102 as partially shown for example in FIG. 3.

The foldable walker apparatus includes a collapsible basket 114 that extends between the support members 100 and 102. The collapsible basket 114 is best shown in FIGS. 19 to 22. The collapsible basket 114 includes a basket member 125 made in this example of flexible fabric. The term fabric is used in the broadest sense of the word, and may include non-woven material, plastic, flexible sheets and other such materials. The basket member 125 in this example has a top 126 with abutting faces 123, 127 and 129. The top 126 has an opening 128 for inserting objects into an interior 130 of the basket member. The basket member 125 includes sides 131 and 133 that extend downwards from the top 126 from the perspective of FIG. 19. The sides 131 and 133 in this example are made of netting. A bottom 135 opposite the top 126 connects the sides 131 and 133. The bottom 135 in this example is made of continuous, non-netted fabric.

The collapsible basket 114 includes spaced-apart end members 118 and 118.1. Each end member, such as end member 118, is flat and includes a rigid peripheral portion which in this example is a wire loop in this example 5-sided wire frame 147. The basket member 125 extends between and is supported by the wire frame of the end members. The end members are moveable towards each other when the walker apparatus is folded due to the flexibility of the basket member

125. The basket member may thereby fold to collapse the collapsible basket 114 when folding the walker apparatus. Importantly, this is possible without needing to remove the collapsible basket 114 from the walker apparatus.

Each of the end members is substantially the same with the same structure and function. Generally only end member 118 will be discussed in detail with like parts of end member 118.1 having like numbers and the additional designation “.1”. As shown in FIG. 22, end member 118 in this example includes an insert 121 which diagonally extends from the top 126 to the side 131. The end member 118 may include a flap member 124 to further secure the insert 121 to the end member 118. The insert 121 includes an extended grooved projection 117 as best shown in FIG. 21A.

A connection bracket 120 is shaped through a grooved housing 137 to slidably receive the grooved projection 117. The groove housing 121 is best shown in FIG. 21A, which shows the connection bracket 120 partially in section. Referring back to both FIG. 19 and FIG. 1, each connection bracket in this example connection bracket 120.1 includes a first connector 116.1 which fastens the connection bracket 120.1 to the support member 100 near the distal end 104 of the support member 100. The connection bracket 120.1 includes a second connector 122.1 spaced-apart from the first connector 116.1 by the grooved housing 137.1. The second connector 122.1 fastens the connection bracket 120.1 to the rod 106. Connection bracket 120 is substantially similar corresponds to the corresponding support member 102 and rod 105. The collapsible basket 114 is thereby slidably securable with and removable from the walker apparatus 20.

The walker apparatus 20 includes a folding mechanism 136 as best shown in an unfolded mode in FIGS. 23 to 25. The folding mechanism may be referred to as a means for bringing together the frame members 22 and 24 for folding the walker. The folding mechanism 136 includes a pair of spaced-apart inner frame members 138 and 166. Inner frame member 136 includes a first part 140 and a second part 157. The first part 140 has a first end 142 that pivotally receives and thereby pivotally connects to the support member 100 via a first extended pivot rod 141, as shown by FIG. 23 in combination with FIG. 1. The first part 140 has a second end 144 spaced-apart from the first end 142. A pivot 146 at the second end 144 pivotally connects the first part 140 to a hinge member 150.

The second part 157 includes a first end 158 with a bolt 160 that connects the second part 157 to the hinge member 150. Bolt 162 near the first end 158 also connects the second part 157 to the hinge member 150. The first part 140 and the second part 157 of the inner frame member 138 are thereby hingedly connected together. The second part 157 has a second end 164 which is spaced-apart from the first end 15. The second end 164 pivotally receives and thereby pivotally connects to the support member 102 via a second extended pivot rod 165, as shown by FIG. 23 in combination with FIG. 1.

The inner frame member 166 includes a first part 168 and a second part 176 that are pivotally connected together via pivot 174. The first part 168 has a first end 170 with a connector 171 that pivotally receives and thereby pivotally connects with the rod 106. The first part 168 has a second end 173 with teeth 172 extending therefrom above and over top of the pivot 174. The second part 176 has a first end 179 with teeth 178 extending therefrom above and over top of the pivot 174. The teeth 172 and 178 are positioned to inter-engage in an over-the-center action in the extended mode and thereby inhibit further movement of the inner frame members towards the lower ends of the outer frame members. The second part has a second end 180 with a connector 181 that pivotally receives and thereby pivotally connects with the rod 105.

The folding mechanism **136** includes a pair of link members **184** including a first link member **186** and a second link member **194** which form an x-shaped arrangement when fully open. The first link member **186** pivotally connects at a first end **188** via pivot **189** to the first part **168** of the inner frame member **166**. The first link member **186** pivotally connects at a second end **190** via pivot **191** to the second part **157** of the inner frame member **157** near the first end **158**. The first link member **186** includes a bend **187** that extends outwardly towards the adjacent outer frame member **22**. In this example, the bend **187** extends towards the first end **142** of the first part **140** of the inner frame member **138**.

The second link member **194** pivotally connects at a first end **196** via pivot **197** to the second part **176** of the inner frame member **166**. The second link member **194** pivotally connects at a second end **198** via pivot **199** to the first part **140** of the inner frame member **138** near the second end **144**. The second link member **194** includes a bend **195** that extends outwardly towards the outer frame member **24**. In this example, the bend **195** extends towards the second end **164** of the second part **157** of the inner frame member **138**. A square bracket **155** outwardly extends from the second link member **194** to enable the first link member **186** to slidably pass there-through. The pair of link members **184** thereby diagonally extend between and operatively connect the inner frame members **138** and **166** together.

The operation of the folding mechanism **136** is illustrated in FIGS. **26** to **30**. FIG. **26** shows the folding mechanism **136** on the walker apparatus **20** in the unfolded or fully open mode. FIG. **27** shows the folding mechanism **136** in a partially folded mode. The user pulls the seat handle **148** upwards from the perspective of the FIG. **27**. This causes the first part **140** and the second part **157** of the inner frame member **136** to fold through pivot **146** together and towards each other. Because the link members **185** and **194** are connected close to the seat handle **148**, the actuation of the seat handle **148** also causes the first link member **186** and the second link member **194** to pull the first part **168** and the second part **176** of the inner frame member **166** to fold together and towards each other by means of pivot **174**. The inner frame members continue to fold together until a fully folded mode is reached as shown in FIGS. **28** to **30**. The foldable walker **20** is thereby laterally folded together in a compact, upright manner, with the outer frames **22** and **24** coming together. Advantageously, the foldable walker **20** may remain standing in the fully folded mode and be moved like a piece of luggage on wheels.

The structure of the present invention provides many advantages. For the brake pad assembly, because both the brake pad mechanism **200** and means **214** for connecting and adjusting are within the brake housing **277**, the life of these components is prolonged by the housing, inhibiting the entry of dirt and rocks therein. Also, the brake housing **277** provides a compact, streamline solution for covering the mechanism **200** and means **214** so as to protect the interior against general wear and tear, to inhibit damage from the user's feet, and to inhibit entanglement with the user's clothes, which ensures that the walker apparatus is safer. Conveniently, when the brake pad needs adjusting, the covering portion **261** is readily removable for accessing the means **214**.

The brake rod of the present invention provides the advantage of being self-adjusting and without requiring user intervention or being accessible to the user. The gripping member **99** may slide along the brake rod until such time as braking is needed. The gripping member **99** continues to be engageable to operate for braking even if the thumb screw is loose, unscrewed, strip-threaded or otherwise damaged. This pro-

vides an added layer of safety for the user as it inhibits the user from tampering with or adjusting the brake rod assembly. It provides the advantage of ensuring that braking still works when the user needs to brake but, for example, where the walker apparatus has been damaged through an accident, or where the user does not have the sufficient dexterity to make other adjustments.

The frame shape of the walker apparatus, and in particular the support members **100** and **102** with their arc-shape provide the advantage of allowing a light, aircraft-quality aluminum to be used but still maintaining high strength and support requirements. In one example, the structure with the seat **139** resting on the apexes of the support members provides a rated weight capacity of at least 300 lbs. Because the frame locates the seat **139** in the middle of the walker apparatus, that is, halfway between the wheels, the frame thereby provides a walker apparatus that is more stable and therefore safer.

The collapsible basket **114** has the advantage of requiring very few parts: simply two connectable end members each having a rigid peripheral portion with fabric stretching around therebetween. The basket **114** is more user-friendly in that it can remain connected to and need not be removed the walker apparatus when the walker is folded. The basket **114** connects and folds in such a manner as to not comprise the integrity of the support members **100** and **102** or other aspects of the walker frame. Because the sides **131** and **133** are made of netting as opposed to continuous fabric, this allows the basket **114** to fold even more easily.

The folding mechanism provides a structure that better promotes lateral support and is therefore more robust. The bends **187** and **195** offer more resistance to shear forces acting, for example, against the support members. Because the links **186** and **194** intersect, they inhibit torsional twisting of the frame of the walker apparatus. The inner frame members **136** and **166** further promote lateral support. This means that the folding mechanism only requires two cross links **186** and **194** for its functioning and therefore uses fewer parts. This results in the advantage of providing a folding mechanism that is easier to manufacture and thus less expensive. The bends **187** and **195** also enable the folding mechanism to fold laterally in a more compact manner.

Because the links **186** and **194** are spaced inwardly from the support members **100** and **102**, this provides the walker apparatus with a folding mechanism that is more compact and less likely to tangle with the user's clothing. Also, it results in a folding mechanism that is more durable if the walker is dropped or otherwise damaged because the links **186** and **194** are adjacent to the support members **100** and **102** and seat **139**.

Those skilled in the art will appreciate that many variations are possible within the scope of the inventive aspects of the walker apparatus. For example, instead of the folding mechanism **136**, other means may be used for bringing together the frame members for folding the walker, as are known to those skilled in the art, for the non-folding inventive aspects of the walker apparatus.

For aspects of the invention other than the brake rod, those skilled in the art will appreciate that, instead of a brake rod, other means for actuating a brake pad mechanism may be used for the walker apparatus.

The handle bar assembly disclosed in the present invention is just by way of example. Those skilled in the art will appreciate that other means for engaging a brake pad mechanism may be used for the walker apparatus.

Those skilled in the art will appreciate that, instead of the brake pad mechanism **211**, other brake pad means for braking at least one of the wheels may be used for the walker appa-

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ratus for its non-brake pad and non-brake housing inventive aspects. Likewise, other means 214 for connecting and adjusting the corresponding brake pad may be used for the walker apparatus for its non-brake pad and non-brake housing inventive aspects.

It will further be understood by a person skilled in the art that many of the details provided above are by way of example only and can be varied or deleted without departing from the scope of the invention as set out in the following claims.

What is claimed:

1. A brake rod assembly for a walker apparatus, the assembly comprising:

a brake rod operatively connected to a brake for braking the walker apparatus;

a connection member operatively connected to a brake handle; and

a gripping member that is spring-biased to slidably receive the brake rod, the gripping member including a coupling plate and an adjustment mechanism rigidly connected thereto, the coupling plate and the adjustment mechanism forming a unitary structure the adjustment mechanism adjustably engaging the connection member, whereby actuation of the connection member tilts the gripping member upwards and causes the coupling plate to engage the brake rod for braking the walker apparatus.

2. The assembly as claimed in claim 1 wherein the coupling plate selectively engages the brake rod.

3. The assembly as claimed in claim 2 wherein the coupling plate includes an aperture through which the brake rod extends, and wherein portions of the coupling plate adjacent to the aperture grip the brake rod when the gripping member is tilted upwards.

4. The assembly as claimed in claim 2 further including a block member interposed between and connecting together the coupling plate and the adjustment mechanism.

5. In combination, a brake rod assembly as claimed in claim 1 and a walker apparatus therefor.

6. The combination as claimed in claim 5 wherein the connection member extends from the brake handle, through the gripping member and to the brake.

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7. The combination as claimed in claim 5 wherein the walker apparatus includes a pair of telescoping tubes within which is disposed the brake rod assembly, the brake handle operatively connecting to a first one of the tubes, the brake operatively connecting to a second one of the tubes, and at least one of said tubes having an aperture through which the adjustment mechanism is accessible.

8. The combination as claimed in claim 5, the walker apparatus including a brake and a brake handle.

9. A brake rod assembly for a walker apparatus, the assembly comprising:

a brake rod operatively connected to a brake for braking the walker apparatus;

a connection member operatively connected to a brake handle; and

a gripping member that is spring-biased to slidably receive the brake rod, the gripping member including a portion and an adjustment mechanism rigidly connected thereto, the adjustment mechanism and the portion of the gripping member forming a unitary structure, the adjustment mechanism adjustably engaging the connection member, whereby actuation of the connection member tilts the gripping member upwards and causes said portion of the gripping member to engage the brake rod for braking the walker apparatus.

10. A brake rod assembly for a walker apparatus, the assembly comprising:

a brake rod operatively connected to a brake for braking the walker apparatus;

a connection member operatively connected to a brake handle; and

a gripping member that is spring-biased to slidably receive the brake rod, the gripping member including a coupling plate and an adjustment mechanism rigidly connected thereto, the adjustment mechanism adjustably engaging the connection member and being positioned above the coupling plate, whereby actuation of the connection member tilts the gripping member upwards and causes the coupling plate to engage the brake rod for braking the walker apparatus.

\* \* \* \* \*



UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 9,180,065 B2  
APPLICATION NO. : 13/863029  
DATED : November 10, 2015  
INVENTOR(S) : Julian Liu

Page 1 of 1

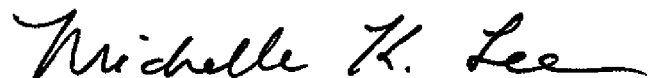
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

IN THE CLAIMS

Column 11 Lines 11-26 should read

1. A brake rod assembly for a walker apparatus, the assembly comprising: a brake rod operatively connected to a brake for braking the walker apparatus; a connection member operatively connected to a brake handle; and a gripping member that is spring-biased to slidably receive the brake rod, the gripping member including a coupling plate and an adjustment mechanism rigidly connected thereto, the coupling plate and the adjustment mechanism forming a unitary structure, the adjustment mechanism adjustably engaging the connection member, whereby actuation of the connection member tilts the gripping member upwards and causes the coupling plate to engage the brake rod for braking the walker apparatus.

Signed and Sealed this  
Second Day of February, 2016



Michelle K. Lee  
*Director of the United States Patent and Trademark Office*